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CHANGED BELIEFS OF COLLEGE STUDENTS *

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COLLEGE students are commonly believed to be more intelligent than non-college people of similar ages. At least, they have assimilated enough pre-college pabulum, such as it is, to be certified by those who are supposed to know, as fit to enjoy the academic privileges of college, such as they are. They are also frequently regarded as the "hope of America", the leaders of the future, the bearers of the torch of progress, the builders of that cleaner, saner, more beautiful civilization of which we dream in our more optimistic moments.

If even part of this is true, it is important to know what they are thinking; to find out, if possible, what changes are occurring in their ideas and ideals. To know what a man believes at the moment is perhaps not so indicative of his mental growth and maturity as to know what he has been forced to disbelieve in order to arrive at his present opinions. It is difficult, if not impossible, to tell why or when we change our minds; nor is it really so important. The important fact is, the change. Our whole life-experience is involved directly and indirectly in every modification of our behavior.

Six years ago I was interested in attitude study although I had given little thought to the theory or methodology of such study. So I collected some 6,000 statements from college students regarding matters upon which they said they had changed their ideas. Shortly thereafter I changed my own ideas considerably

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about opinion and attitude research with the result that this material was never tabulated and analyzed. This fall at the instigation of Professor Angell and by grace of F.E.R.A. aid, I decided to complete the study by gathering similar material and comparing it with the material collected in 1928.[1]

If an attitude is the "overt adjustive behavior of an individual", this decidedly is not an attitude study.[2] It may be a study of opinions though I am not even sure of this. No claim is made that the students would act in accordance with the ideas they say they now hold; nor can we be sure that they have really discarded the beliefs indicated if "discarding" means they do not or will not act or speak in accord with the beliefs they claim to have changed. Neither can we assume that they have accepted as a guide for belief or action, the logical opposites of the ideas they claim to have discarded. All we can conclude is that under the conditions of the investigation they say they have discarded certain beliefs they claim they once held. We cannot be sure of the motives determining the statements of the alleged discarded beliefs, but I feel sure that had each student been asked one week later to make the same statement, there would have been little correspondence between the two lists. So perhaps this should be called a doubtful study of the careless verbal behavior of 758 college students regarding some of their possibly changed ideas. However, there are some interesting differences between the material collected in 1928 and 1934. These discarded beliefs may or may not be actual, and if they are real, they may or may not be significant.

The material was collected by having sociology students get ten other students to write down ten discarded beliefs,—the first ten that came into their minds. We believe that the informants constitute a fair sample of students in the four classes, possibly skewed toward juniors and seniors, as well as proportional numbers registered in Arts, Business and Education. The papers were unsigned but sex was indicated. The original lists were required to remove the possibility that some students might manufacture ten lists rather than collect them from the ten separate subjects. In spite of this precaution, we had to throw out many lists that were obviously faked. This fall, the same method was

[1] Wesley Miller did the laborious work of tabulating and also offered many valuable criticisms and suggestions.

[2] See my "Attitude on Attitude Research", American Journal of Sociology, May, 1928, pp. 940–957, for theoretical discussion, especially, pages 950–952. For other views and an extensive bibliography see my, "Theory and Measurement of Attitude and Opinions", Psychological Bulletin, May, 1930, pp. 357–379.

used but each collector was asked to write his impression of his subjects' responses. Many of them stated that the *first* reaction of many students was that they had not discarded ten beliefs. Most of them had to use Santa Claus, Easter Bunny and similar infantile folklore to get ten items, and many failed even then.

After eliminating all doubtful lists,—those manufactured, those obviously in the comic spirit, those not stating sex, those too vague to permit tabulation,—we had statements from 165 males and 293 females for 1928, totaling 4,231 discarded beliefs. For 1934 we used the lists of 150 male and 150 female students, totaling 2,516 items.

How valid is this method? Is it better, or worse than a more formal procedure? There is the danger that the collectors themselves will make up the lists. We met this as described above. By throwing out all the suspected lists we got original statements from 758 different students. There is the danger that the subjects will not take it seriously. But this is true of all student responses to questionnaires, however formal and carefully prepared they may be. We threw out all lists and specific statements that seemed silly, inconsequential or not made in good faith. One of the most serious objections is that the collectors may not give identical instructions to their subjects. We are sure that some of them said "changed since coming to college" instead of "any discarded beliefs" as was specifically requested. However, this seemed to make little difference in the nature of the lists, the main one probably being fewer superstitions in the former than in the latter. The great frequency of Santa Claus and Easter Bunny shows most of the collectors followed directions. There is the danger that the statements may be so vague and general that tabulation is impossible. We tried to avoid this by insisting that the discarded beliefs should be definite and concrete. We rejected all that were not. There is the danger that the beliefs will not be "the most important"—whatever that means;—that the student does not have time "to think" and hence omits many he would include if he could take more time. This is really an advantage, I think, for the reasons discussed below.

The absence of a formal schedule removes the danger that the investigator will be giving the cue for the response. Schedule-items are suggestions and hence may falsify the picture presented by this kind of data. Many similar studies, in my opinion, are more or less invalid because the data were collected by this schedule-suggestion method. Anonymity encourages the state-

ment of discarded beliefs that are more or less taboo. Our lists show that many conventional inhibitions were more or less inoperative. Being approached by a fellow student usually of the same sex in a non-groupal relation rather than by a professor in the mixed-sex, formal, classroom group relationship may also contribute to this.

Perhaps the most interesting aspect of this method of collecting such data is the device of having the subject write down the first ten things that come into his mind. The insistence upon ten things is important—else many subjects would write little or nothing. The emphasis upon "*any* beliefs you have discarded" is also important. This is likely to give a better cross-section than if he were allowed to cogitate and so present a list more in accord with the rôle he imagines or hopes he is playing; or worse, more in accord with the rôle he thinks, or thinks you think, an intelligent college student should be playing. This method tends to catch him off his self-regarding guard. It approximates free association. Infantile, irrational and trivial beliefs are likely to appear closely associated with more recent, more serious, more mature changes of opinion, as well as many that are still being redefined. Ideas that are highly emotionalized, that is, which betray inner conflict, are likely to emerge. If he is limited by a list to check, by a specific time, such as "since coming to college", by such meaningless directions as "most important", he is put on his guard, invited to rationalize, to play his rôle, and so defeat our purpose of finding what kind of mental-emotional furniture and organization he really has.

Another method of collecting such data would be to have the students make out their lists in the classroom. This would have the advantage of standardized directions, but has the disadvantages of greater formalism, rôle-playing, professorial domination, mixed-group inhibitions and lessened anonymity, mentioned above as advantages of the method used in this study.

The tabulation problem of this method offers serious difficulties. Here are 6,747 separate and distinct statements of 758 students. They are meaningless until classified. After several preliminary attempts, we selected the classification scheme presented in Table I. We prepared a schedule for each category to guide our judgment in tabulating the specific discarded beliefs. Some of these criteria are admittedly arbitrary, but they enabled us to achieve approximate consistency in tabulating each type of belief. We found by rather extensive trial and conference that

we were able to place the various items in appropriate categories with considerable degree of agreement.

It would be interesting to see what results two other tabulators would get, using our classification and original data; or perhaps it would be more interesting to see what we should get if we were to do it again. It would also be interesting to see what kind of a classification other investigators would make were they required to tabulate our 6,747 statements. This matter deserves more attention than it usually receives from those who work with material similar to this. Most such studies, including this one, are scientifically suspect because of this methodological difficulty. Possibly all quantification of such material is wholly worthless

TABLE I

PERCENTAGE DISTRIBUTION OF DISCARDED BELIEFS OF MALE AND FEMALE COLLEGE STUDENTS FOR 1928 AND 1934

Types of Beliefs	1928			1934		
	Male	Female	Total	Male	Female	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Economics	2.5	1.3	1.7	4.4	1.6	2.9
2. Religion	14.7	14.9	14.8	11.2	11.6	11.4
3. Family Life	5.9	7.4	6.8	4.6	7.0	5.8
4. Sex Questions	9.0	9.9	9.3	15.2	17.6	16.5
5. Politics	9.5	5.5	7.0	8.1	2.7	5.2
6. Education	11.5	7.4	9.0	22.7	13.4	17.8
7. Ethnocentrism	7.5	5.5	6.3	2.5	2.8	2.7
8. Ethics	2.3	1.7	1.9	2.5	2.1	2.3
9. Superstitions	17.2	30.3	25.3	10.3	19.8	15.3
10. Philosophy of Life	7.1	5.4	6.1	12.9	12.1	12.5
11. Esthetics	1.1	1.1	1.1	0.2	0.8	0.6
12. Factual Ignorance	11.7	9.6	10.4	5.2	8.7	7.0
Total	100.0	100.0	99.9	99.8	100.2	100.0
Total Discarded Beliefs	1631	2600	4231	1200	1316	2516

Percentages in each column are derived from totals at base of each column

unless and until the fault is remedied by re-classifications and re-tabulations of the same materials by a sufficient number of investigators as well as by sufficient repetitions of the same type of investigation.

Table I shows the percentage distribution of discarded beliefs for 1928 and 1934. I shall refer only to the most marked differences between the two years and two sexes.

For the change in beliefs classified as Economic, there was little difference between the two sexes and the two years, though both showed some increase. This category ranked 11 in 1928 and 9 in 1934. The males showed a greater increase than the females, however.

Religion ranked 2 in 1928 and 5 in 1934 with no marked differences between the sexes. This might indicate a decreased interest in religious questions during the six years. Perhaps the problems that used to disturb students are solved earlier, or tend simply to be ignored now. Students may be more orthodox or more liberal,—probably the latter.

Family Life ranked 7 in both years, the females showing slightly greater percentages of change than the males. The females ranked 5 in 1928 and 7 in 1934, however, showing a relative decrease in change of belief connected with family life; the males reversed this tendency, the rank order being 9 and 8.

The amount of change on Sex Questions showed a marked increase in percentage from 1928 to 1934 although the rank order changed only from 4 to 3. By sexes, however, the change was greater. This category ranked 6 for males and 4 for females in 1928, but 2 for both sexes in 1934. This would seem to indicate that while revision of beliefs regarding religion is less marked now than in 1928, revision of ideas about sex is greater.

Politics ranked 6 in 1928 and 8 in 1934, the females having dropped from 6 to 9, the males from 5 to 6.

Education shows the second greatest shift of all the categories. It ranked 5 in 1928 and 1 in 1934; males rising from 4 to 1 and females from 5 to 3. The male percentage increased almost 100 per cent; the female, about 80 per cent. This may indicate a rather important tendency for college students to be more critical of educational matters now than in 1928. Perhaps this is a result of the depression though one would expect this to be more definitely reflected in economic beliefs.

There was a decline in changes on Ethnocentrism, the rank being 8 and 10 with little difference between the sexes. The same is true of Ethics, 10 and 11; Esthetics ranked 12 in both years.

Superstitions dropped from 1 to 3, the most outstanding change being among the males with whom it ranked 1 in 1928 and 5 in 1934. The change in total percentage was 10, the largest in the whole list. The female percentage dropped 10.5 in the six years, the males, 6.9. While the females showed a great excess over the males in the discarding of superstitions, they appear to have been discarding them at a relatively greater rate six years ago than at present.

Philosophy of Life rose from 9 to 4, the greatest shift of any category. The men exceed the women slightly in both years. We classified under this heading all changes of belief expressing gen-

eralized value judgments such as honesty, pessimism, optimism, evolution, equality, democracy, progress, science, and the like.

There was a decrease in the percentage of changes that merely indicated factual ignorance, the rank order being 3 and 6. A larger percentage was recorded by men than women in 1928. This was reversed in 1934. This is one of the least satisfactory of our categories. Perhaps all of these statements should have been thrown out. We tabulated them to see if there would be any noticeable differences between the two years and the two sexes. A typical statement in this class is "I used to believe that Columbus was the first white man in America". Possibly the students of 1934 really learned less factual error during their childhood than did those of 1928,—but I doubt it.

The material in Table I may be briefly summarized as follows. Only two categories, Family Life and Esthetics, had the same rank in both years. Of the remaining ten categories, two, Religion and Factual Ignorance, lost rank by three places or more; and two, Education and Philosophy of Life, gained by the same amount. For the males, two categories, Superstitions and Factual Ignorance, lost rank by three points; three categories, Sex Questions, Education, Philosophy of Life, gained by the same amount. For the females, four, Religion, Politics, Ethnocentrism, Factual Ignorance, lost rank by three points or more, and only one, Philosophy of Life, gained by the same amount. It is evident from this that the ideas we classified as Philosophy of Life, Religion, Education, Sex Questions, Superstitions and Factual Ignorance are the ones about which there was the greatest shift of opinion. Esthetics, Ethics and Family Life showed the least change.

We were also interested in the shifts of opinion with reference to specific ideas. The data for these are found in Table II. Our choice of items for tabulation in this table was not entirely arbitrary. We were guided by two factors: The apparent frequency of some of them in our preliminary tabulations and our curiosity. Space as well as the doubtful significance of some items prohibit the analysis of all the material in Table II.

However, I want to call your attention particularly to items 17 and 25, Fraternities and Easter Rabbits. These data may illustrate a possible major methodological defect in many studies of verbal behavior,—this one, for example. At first glance, it would seem that college students show a much greater tendency in 1934 than in 1928 to discard the belief that fraternities are desirable,—

TABLE II

PERCENTAGE OF COLLEGE STUDENTS DISCARDING CERTAIN BELIEFS, BY SEX, 1928 AND 1934

Have discarded the idea that—	1928			1934		
	Male	Female	Total	Male	Female	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Education is for making money	7.3	2.4	4.2	0.7	0.7	0.7
2. Profits motive is necessary, desirable	9.1	4.8	6.3	10.7	10.7	8.3
3. There is an after life	25.6	25.3	24.7	10.0	18.0	14.0
4. Bible was inspired	4.8	6.5	5.9	0.0	0.7	0.3
5. God and Devil are like men	16.4	24.6	21.6	5.3	8.7	7.0
6. Parents are perfect	9.1	13.7	12.0	7.3	8.0	7.7
7. Stork—etc., brings babies	33.9	32.1	34.9	8.0	25.3	16.7
8. Divorce is wrong	1.8	6.5	4.8	0.0	2.0	1.0
9. I was an adopted child	0.6	3.4	2.4	0.0	0.0	0.0
10. There was one true love	0.0	7.8	5.0	0.7	4.7	2.7
11. Sex was dirty and shameful	23.0	30.7	28.0	3.3	2.0	2.7
12. War was inevitable and desirable	9.1	3.1	5.2	3.3	2.0	2.7
13. War could and should be abolished	1.2	0.0	0.4	0.0	0.7	0.3
14. Washington and Lincoln were supermen	23.6	10.6	15.3	2.7	3.3	3.0
15. Political parties are honest, necessary	7.9	5.5	6.3	3.3	1.3	2.3
16. Teachers know everything	22.4	16.4	18.6	11.3	6.0	8.7
17. Fraternities are desirable	6.1	2.4	3.7	18.7	12.0	15.3
18. Printed material is always true	7.3	5.5	6.1	3.3	0.7	2.0
19. Jews are obnoxious	1.2	1.0	1.0	0.0	0.0	0.0
20. Negroes are inferior	3.0	2.0	2.4	3.3	1.3	2.3
21. Drinking is desirable	1.2	0.0	0.4	0.7	0.0	0.3
22. Drinking is undesirable and sinful	7.9	4.1	5.5	9.3	9.3	9.3
23. Rain and thunder are caused by super-earthly beings in heaven	6.1	8.5	7.6	1.3	6.0	3.7
24. Santa Claus exists as a man	40.0	44.0	42.6	12.7	30.7	21.7
25. Easter rabbits lay eggs	20.6	64.5	48.7	8.0	18.0	13.0
26. Luck can be changed by charms	37.6	27.6	31.2	2.7	4.7	3.7
27. Fairies exist	7.3	19.8	15.3	0.7	12.0	6.3
28. Man was created supernaturally	7.9	9.9	9.2	6.0	4.7	5.3
Total Number of Students	165	293	458	150	150	300

almost five times as great. Apparently there was also an even greater difference in the discarding of Easter Bunny folklore—it was much less in 1934 than in 1928.

Many possible intrepretations of these figures readily come to mind, but the most probable one is that the data for 1928 were collected close to Easter, while the data for 1934 were obtained in the midst of the painful disillusion and semi-hypocrisy of the fall rushing season. Bunny and Fraternity may appear more frequently in our lists because of what may be called a 'seasonal employment' of consciousness. An obvious criticism at this point is that the data should have been collected at the same time each year. This was impossible under the circumstances but it was a fortunate thing, I believe, because it called my attention to the possibility that verbations, which are sometimes called opinions and attitudes, may be seriously distorted when they are collected at certain times of the year, or under other more or less fortuitous circumstances. I might have failed to note this possible defect in the methodology of such studies as this, if I had collected my data at the same time each year.

My theory is that a great many verbal statements, whether they be called attitudes, opinions, wishes, desires, hopes or fears or what-not, are very ephemeral—mere vocal ripples upon the unexplored seas of consciousness. These ephemeral verbations are aroused to expression by the occurrence of seasonal culture activities, temporary intensifications of public consciousness, recent events that are dramatic, horrific, or even comic and ridiculous. This hypothesis could be tested quite easily, I think.

Several marked changes between 1928 and 1934 on our list might be at least partially accounted for by this theory. The much greater change in 1928 than 1934 on Afterlife, Inspired Bible, God is a man, and Creation (3, 4, 5, 28) may be a reflection of the recency and reverberations of the Tennessee evolution trial of 1925. The anti-war agitation (12) and the hope of peace were much more potent in 1928 than they are now. The apparent shift toward drinking may be due to the success of the repeal movement. The greater discarding in 1928 of the belief that Washington and Lincoln were supermen (14) may be due to the fact that the data were collected close to the birthdays of these heroes. The greater denial of the profits motive in 1934 (2) may be merely a transient depression effect. The greater mention of Easter Rabbits, Luck and Fairies in 1928 may be the result of collecting data so close to Easter and the Seventeenth of Ireland. In all

these cases, however, the sex differences in response cannot be accounted for by this theory.

There are also some other marked changes that cannot be plausibly accounted for by the theory of ephemeral verbation. Among these are non-seasonal superstitions and folklore such as 'Storks bring babies' (7), Adopted Child Fantasy (9), Teachers know everything (16), and Parents are perfect (6). A possible explanation of these differences is that a larger number of the 1934 data collectors instructed their subjects, contrary to directions, to list only beliefs changed "since coming to college" or ones that are "really important". I see no reason why this should be so, but even if it is, there still remain marked differences between the two sexes which would appear to be significant.

It is interesting that such large percentages of discarded beliefs should refer to superstitions, folklore and factual ignorance, whatever may be the reasons for the differences between 1928 and 1934. This seems to warrant the conclusion that such mental maturity as college students achieve is gained to a considerable extent by getting rid of a large amount of irrational nonsense inculcated by loving but foolish parents while the children are still quite young and unable to defend themselves against the absurdities which flourish so abundantly in our culture. We may well wonder how much of this cultural unreason all of us are still carrying around in the secret depths of our minds. Why should it be necessary for children ever to go through the often painful and in any case useless process of learning and unlearning a lot of piffling nonsense? The folly and falsehood and hypocrisy of the cultural hangover we have just gone through this month (Dec.) offers a vivid example of *how* it is done, though Echo must still answer "Why?" A face value acceptance of our figures might indicate some improvement since 1928, but for the reasons given above, I doubt the validity of such an interpretation.

There remain some changes of belief indicated by our figures which may be plausibly regarded as showing a definite shift in the ideas of college students during this six year period. Discarding the ideas that education is primarily for the purpose of making money, that teachers know everything and that printed material is always true, may indicate a growth in critical-mindedness. The remarkable drop from 28 to 3 per cent on Sex is dirty and shameful probably reflects a real and enduring change in sex mores which has been going on rapidly during the lifetime of these students. The great decline in the Stork stories, the

one-true-love idea of the women and the wrongness of divorce, also of the women, fit into the same pattern. I should think there was considerable improvement during the six years which separate these two groups both in the amount and quality of the sex education they received. The decline in the Washington-Lincoln myths may indicate some diminution of the Great Man theory of history. I should like to think it is this, rather than the distorting effect of the birthday-consciousness mentioned above.

Finally, I think it has been evident in all the foregoing discussion that my chief interest in this paper is methodological. At the moment, I feel sure no generalizations of fact and few valid conclusions as to method are possible when we are dealing with such material as this. The problems to which we should address ourselves most seriously are those of collection and classification of data. This must be done over and over until scientifically valid techniques are established. Then such valid data must be collected over wide areas in great numbers for long periods of time. Then we should be able to make some valid factual statements regarding changes in belief. Whether we should then be able to tell why these beliefs are changing and what is the social significance of such change, I do not know. Of this, however, I am certain: Until the methodological problems are solved, all the Herculean labors now being performed in this field will clean no Augean stables nor slay any Lernæan serpents of social ignorance. Most of it is aimless and futile and unfit to be called scientific research and hence brings no great (although much needed) scientific prestige of sociology. More researches should be primarily methodological. We try to be too practical before we are scientifically equipped to deliver the goods.

A MEASUREMENT OF CHANGES IN ATTITUDES AND INTERESTS OF UNIVERSITY STUDENTS OVER A TEN-YEAR PERIOD *[1]

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NEED FOR LONG-TIME STUDIES OF CHANGES IN ATTITUDES

FOR many years the traits and personalities of college students have been a subject of popular interest. Recently that interest has become more scientific. Thus much work has been done with attitude scales and some attempts have been made to measure permanence of attitudes and traits. To date, however, no very comprehensive analytical study appears to have been made of changes in attitudes of a large group of college students over a considerable number of years. This paper is a report of such an attempt—an attempt to determine, as regards both general trend and detail, changes in attitudes and interests in large student groups from 1923 to 1933.

MATERIALS AND CASES

The investigation has a specific antecedent as regards both instrument used and groups studied. The instrument was the Pressey X-O Test (Form B) which is essentially an instrument permitting the very rapid inventory of a large number (375) of an individual's attitudes toward borderland issues of morals and manners (Test I), his anxieties (Test II), and his interests (Test III).[2] In 1923 O. R. Chambers gave this test to 2,970 cases, about 2,000 of whom were public school pupils from the seventh grade through high school, and the remainder college students.[3] He found indications of large developmental trends (in total num-

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[1] The paper is a summary of a thesis presented in partial fulfillment of the requirements for the doctorate at the Ohio State University. The writer wishes to acknowledge his obligations to Dr. S. L. Pressey for his guidance in the work.

[2] The first test consists of 125 items beginning "begging, smoking, flirting, spitting, giggling". The testee is directed to cross out such of these items as he thinks wrong, or disapproves of. Test II begins "loneliness, work, forgetfulness, school, blues," and any items are to be crossed out that the testee has ever worried about. In Test III the testee is to mark those things he likes or is interested in, the first of these 125 items being "fortune-telling, beaches, mountains, vaudeville".

[3] Chambers, O. R., "Measurement of Personality Traits", Research Adventures in University Teaching, pp. 71–85, The Public School Publishing Company, 1927, and "A Method of Measuring the Emotional Maturity of Children", Pedagogical Seminary, Vol. 32, pp. 637–47, 1925.

ber of disapprovals, anxieties, and interests) from the seventh grade through college, these trends appearing to be closely related to socio-economic status and to culture patterns. And he made detailed analysis of the responses to each of the 375 items of the test, at each level and for each sex. At that time it was hoped to repeat the study a decade later, to see what measurable changes might have occurred. This paper reports such a repetition.

In this (the 1933 study) approximately the same number of students were tested as in 1923, in the same institution, and selected in essentially the same fashion. The numbers were as follows:

TABLE I

NUMBER OF COLLEGE STUDENTS TESTED IN 1923 AND 1933

	Men					Women					
	Fr.	So.	Jr.	Sr.	Tot.	Fr.	So.	Jr.	Sr.	Tot.	Both
1923.....	266	131	68	50	505	198	76	81	95	450	955
1933.....	140	187	110	88	525	188	200	107	60	555	1080

It may be noted that the upper-class groups are rather small. However, results in these groups were so consistent as to appear to justify their inclusion in the data. Moreover in handling, the freshmen and sophomores were thrown together in a single group of under-classmen and the juniors and seniors similarly combined in an upper-class group, thus making in the aggregate fairly sizable under-class and upper-class groups. The tests were given at about the same time of year in '33 as in '23, and the same general procedure was used.

CHANGES IN TOTAL DISAPPROVALS, ANXIETIES, INTERESTS

The first step, in handling the results, was to count the total number of words crossed, on each test, by each case. Tabulation was then made of these total scores for each sex, and for under-classmen (Freshmen, Sophomores) and for upper-classmen separately. Average scores for each group, on each test, were then found. Results were as follows:

TABLE II

AVERAGE NUMBER OF WORDS CROSSED ON EACH TEST BY COLLEGE UNDER-CLASSMEN (F-S) AND UPPER-CLASSMEN (J-S) IN 1923 AND 1933

	Disapprovals				Worries				Interests			
	Men		Women		Men		Women		Men		Women	
	F-S	J-S	F-S	J-S	F-S	J-S	F-S	J-S	F-S	J-S	F-S	J-S
1923	62	54	66	53	35	36	33	33	63	66	61	62
1933	51	51	52	46	34	31	34	35	59	61	61	64
Diff.	11	3	14	7	1	5	−1	−2	4	5	0	−2

Over the ten-year period there appears to have been little change in the total number of different things worried about, a slight decrease in the number of the men's interests, but a consistent decrease in the number of things disapproved—a consistent liberalizing of opinion. Why so much more change on this test? Because (the writer would suggest) this test directly involved the *mores* or system of morals and manners of the society in which these young people lived; and these mores have become distinctly more tolerant or liberal during the past ten years. Anxieties and interests, however, are less directly involved in the moral code or other systematized and socially controlled group of ideas, and so show little consistent change as a whole.

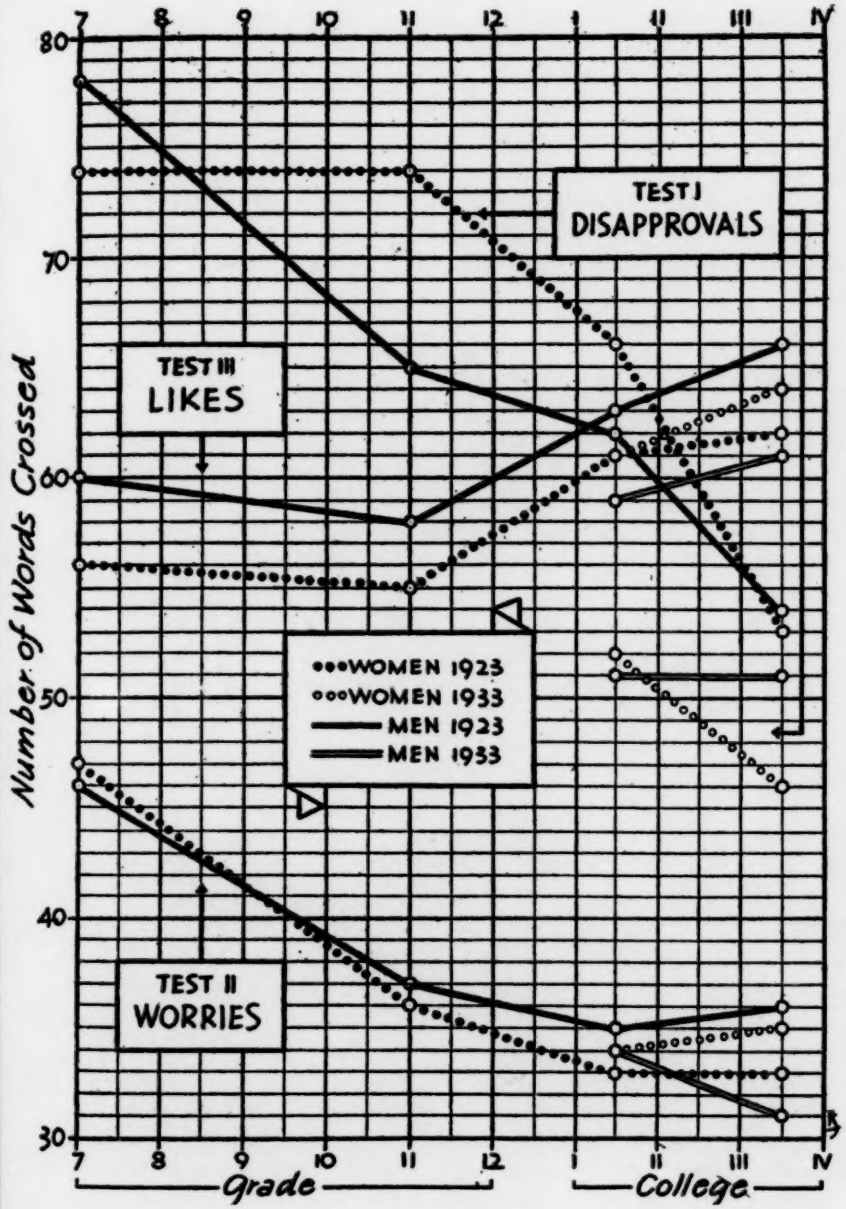
Further comparison with the 1923 data makes this point of view still more plausible. The following graph shows data for both years including, for 1923, data for the secondary school.

The curves for 1923 should receive first consideration. These curves show the worries (lowest curves) slowly decreasing until into college, when there appears to be the start of a rise toward adult anxieties. Sex differences in number of worries appear small. Number of interests decreases slightly through the public school years but rises steadily throughout college.[4] Throughout, boys and men average a larger number of different interests than the girls and women.

Most distinctive is the curve for disapprovals. For the boys and men there is a steady decrease in number of things disapproved—should we say an increasing liberalization of opinion (or an increasing sophistication). However, the girls show no decrease during the public school years—and then during college a drop to a point slightly below the men! The natural explanation is that throughout high school the girls were kept closer to the conventions and more influenced by the home, but that in college (which meant for most of these girls a getting away from home) a marked freeing of thought and attitude took place. In short, the 1923 sex differences suggest the "disapprovals" test as especially sensitive to pervasive social influences.

It is unfortunate that in 1933 the test could not have been repeated in the secondary school also. However, the position of the college 1933 data on the graph deserves attention. Thus it will be noted that the college women now show a greater range

[4] The 1923 tests were given only to even numbered grades, and results for grades 10–12 and 6–8 averaged. Moreover, college data for Freshmen and Sophomores, and for Juniors and Seniors, were averaged. It thus seems reasonable to infer that the turning point in this curve (and in the disapprovals curve to be mentioned shortly) is really at the transition from home and high school to college.


7
8
9
10
11
12
I
II
III
IV
80
70
60
50
40
30
Number of Words Crossed
TEST I
DISAPPROVALS
TEST III
LIKES
TEST II
WORRIES
WOMEN 1923
WOMEN 1933
MEN 1923
MEN 1933
Grade
College

of interests than the men. The marked decrease in number of disapprovals is evident. But a further item is to be noticed here; the decrease *during the college years* is not nearly so great as in 1923. Apparently the liberalizing process has occurred before the college years. Perhaps in 1923 this process was going on primarily only in the younger and more intelligent group which had escaped in some degree from the more narrow conventions of the previous generation—but in 1933 these less restricted modes of thinking had become general. The explanation is at least of some interest.

CHANGES IN SPECIFIC DISAPPROVALS, ANXIETIES, INTERESTS

So much, very briefly, as to changes in total number of items marked, on each test. The next (and most important) question naturally was as to the items which chiefly accounted for such changes in total. To investigate this matter, tabulations were made of the number of students of each sex and class marking each word. These numbers were then slide-ruled to per cents, and combined to give per cent of under-classmen and upper-classmen of each sex marking each word. These per cents were then compared with similar per cents which had been worked out in 1923, and a tabulation made of the 1923–33 differences, for each group of students. . . . It will be appreciated that the total handling thus briefly described was exceedingly laborious, but the work seemed necessary, if the nature of the changes over the decade was to be determined.

Study of the table (and of other features of the total data) led to the conclusion that changes of 20 per cent or more, over the decade, might be considered to merit consideration. Items showing such changes were therefore located, and are presented on the following table. There were, in all three tests, 86 such differences, involving 56 different items. No changes as much as 20 per cent appeared on Test II (worries). On Test I (Disapprovals) there were 52 such changes, involving 30 items; on Test III (Interests) such changes numbered 34 and involved 26 items. The majority of changes in 'disapprovals' occur among the under-classmen. With one exception, "war", they represent decreases in disapprovals. The changes in likes and interests, on the other hand, occur for the greater part among upper-classmen of both sexes.

The major changes seem to fall into somewhat logically associated groups. Smoking, prize-fight, betting, idleness, chewing, poker, tobacco, and craps, all of which in times past have been

considered among the milder vices, are consistently less disapproved by 1933 students. Smoking and tobacco are universally better liked.

Words that have a 'sex' connotation are less disapproved generally. Flirting, immodesty, boldness, toughness and divorce, all

TABLE III

ITEMS SHOWING CHANGES OF 20 PER CENT OR OVER, 1923–33

(DECREASES IN 1933 UNDER 1923 ARE INDICATED BY THE MINUS SIGN)

	Disapprovals					Likes				
	Men		Women			Men		Women	
	F-S	J-S	F-S	J-S		F-S	J-S	F-S	J-S
Begging			—20	—20	Tennis		30		
Smoking	—31		—24	—20	Edison				—20
Flirting	—29	—24	—37	—31	Napoleon		—25		
Silliness				—22	Kissing				23
Extravagance	—26		—25		Athletic girls				—21
Sportiness	—30		—37	—22	Smoking				28
Talking back			—23		Saxophones		—23		
Slang	—28		—28	—24	Bands			22	
Debt				—22	Banjoes	—26	—31	—31	
War	20	29		29	Ragtime	—23		—24	
Socialism	—31		—26		Waltzes			22	23
Toughness			—25	—20	Solos		—22		
Boldness			—23		Society		—22		
Day-dreaming	—20				Banquets		—22		
Spending			—25		Palmistry			—21	
Divorce	—30		—32		Sauerkraut	25	23		34
Hazing			—20		Pop				24
Disgrace		—22		—24	Typewriting			20	
Immodesty			—21		Hamlet	—20			
Truancy			—26		English				52
Prize-fight			—23		Business		—23		
Betting	—29		—32		Business men	—39	—20		
Idleness			—20	—25	Salesmen	—20	—22		
Chewing	—23		—28		Magazines		—24		
Poker	—32		—22		Electricity				—48
Tobacco	—26		—29		Bankers		—21		
Craps			—21						
Freak			—26						
Insanity	—28								
Flunking	—27								
Total words	15	3	23	11	Total words	6	13	6	9

are looked upon with consistently less disapprobation by the college students of 1933 than by those of 1923.

Slang, talking-back and silliness have, in the past, often been categorized as bad manners, as indecorous. The college student of 1933 shows less inclination to disapprove.

Large social and economic trends have their effects upon personal attitudes. The 'depression' is well represented in this

respect. Debt is looked upon with more tolerance. Students show less liking for or interest in business, businessmen, salesmen, and bankers. Socialism has lost much of its former bad odor and comes in for less disapproval.

There is evidence also of the influence of fads and fashions. An increased liking appears for bands and waltzes. On the other hand, ragtime, saxophones, banjoes and solos have lost much of their former favor in the eyes of college students. . . . Not all the items are readily explainable. Some are doubtless due to adventitious circumstances, and, are of little significance. But by and at large, the item analysis yields results reasonably interconsistent and in line with recognized changes in the fields covered.[5]

POSSIBILITIES FOR LONG-TIME, LARGE SCALE INVESTIGATION IN SOCIAL PSYCHOLOGY AND SOCIOLOGY

The above is a very much abbreviated report of a study involving many other interesting items; it has thus been condensed to emphasize certain major points, and also certain potentialities suggested by both the data and the procedure.

In the first place, the data would seem to constitute both a measurement and an analysis of changes in attitudes and interests in a sizable and culturally relatively coherent group, over a decade. Certain culture patterns appear definitely to have been modified, over this period. Such measurements and analyses, if continued and verified, should be of decided importance as showing, more clearly than almost any other data, changes in the "group mind".

In the second place, the investigation would appear to make clear that the group test technique is deserving of careful consideration by sociologists as a means of investigation in that field. A carefully considered program of investigations using such techniques, planned over a period of time and with reference to a variety of groups, and problems, should yield data of great significance—the group test technique might finally develop as a major quantitative instrument in that field.

In the third place, the technique of what might be called the single word question exemplified in the X-O test appears admirably suited for wide range investigation in both social psychology and sociology. The yield of score for a given time from those

[5] Some items may seem bizarre, as the marked increase in liking for sauerkraut. But sauerkraut (as a result of dietary research and other factors) is more popular. And such odd items may be argued to give verisimilitude to the total results.

answering, for a given expense for blanks, and for a given time in handling data, is far above other techniques. Thus the test used presents 375 questions on 162 square inches of paper or three ordinary book pages, these 375 questions are answered by the average individual in about 20 minutes, and tabulation of results can proceed much more rapidly (considering the total number of responses involved) than is possible with more cumbersome questionnaire techniques.[6]

In short, this study has been conceived as an exercise in method as well as an investigation of a particular set of problems.[7]

SUMMARY

(1) The paper reports a comparison, by means of a 375 item group test of moral attitudes, anxieties, and interests, of changes with reference to these items over a ten-year period in college student groups, a total of 2,000 cases being involved in the investigation.

(2) Relatively slight changes over the ten-year period were found as regards total number of indicated anxieties and interests, but decreases as large as 20 per cent in number of things disapproved of. This is considered evidence of a distinct liberalization of opinion. The changes are most marked in the under-class groups, appear to be of pre-college origin, and suggest changes in the "mores" of the population at large, over the decade.

(3) Item analysis of all this material shows these items to fall into certain patterns. Thus the effect of the depression is shown in both interests (as change of attitude toward business) and in disapprovals (lessening disapproval of debt, of socialism).

(4) It is urged that the group test technique has large potentialities for research in the borderland area between sociology and social psychology. It is further urged that the single-word question technique is an exceptionally convenient and useful device for such research.

[6] A modification of this test technique used in the "Interest Attitude Tests" carried convenience further from the point of view of scoring and handling of data.

[7] It may be added finally that further investigations using these general techniques, and touching upon a variety of such borderland problems in the field of social psychology and sociology, are now being worked upon by the Department of Psychology at the Ohio State University.

COMPARISON OF SCIENTIFIC AND LITERARY ABILITY: A BIOGRAPHICAL STUDY OF EMINENT SCIENTISTS AND MEN OF LETTERS OF THE NINETEENTH CENTURY *

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I. THE PROBLEM

THE present paper reports a comparative study of two groups of eminent men: 120 men of science and 123 men of letters, both groups living during the nineteenth century. In general, the study is similar to those made by Cattell, Castle, and the Stanford group in their biographical and statistical investigations of eminent men and women. Its divergence lies in the fact that a direct comparison of two kinds of creative thinkers has been the chief direction of its effort.

For the most part, the previous studies, lumping all eminent men together, have assumed, either explicitly or by implication, one set of traits which would characterize genius in general. But the fact that most of the world's eminent men have achieved distinction in some one definite field of endeavor, for example, in science, in music, in poetry, or in statesmanship, may possibly mean that there are as many different kinds of genius [1] as there are lines of achievement. The comparison of two kinds of creative workers [2] suggests itself, therefore, as a profitable and additional inquiry into problems raised by these investigations. The results, it is hoped, may also serve as one source of evidence on the nature of literary and scientific proficiency and the existence of discrete mental abilities and temperamental types.

II. THE HISTORY

Of the many investigations of superior ability and achievement, we shall briefly outline only the studies directly relevant to this report. This outline is presented not only for purposes

* Received and acknowledged November 10, 1935.

[1] The word "genius" is used in this paper to denote superior mental ability. It does not imply the possession of any trait or set of traits qualitatively different from the traits of human beings who are not geniuses.

[2] An attack directly called for by Cattell, Hutchison, Herzberg, and Dilthey.

of comparison with our results but partly in the hope that it may somewhat order one phase of the vast and chaotic literature in the field of genius.

1. Reflection based on observations not quantitatively treated, such as occasional case histories, has yielded such theories as the following:
   A. The identification of genius and insanity (Lombroso, Marks, de Tours).
   B. Psychoanalytic interpretations of sublimation and compensation for physical and social inferiority (Adler, Freud, Herzberg).
   C. Conceptions of "psychic tension" (Kretschmer) and "coalescence of instincts and objective intelligence" (Hirsch).
   D. The conception of genius as extraordinary potentiality, frequently released from inhibition by drugs and disease, especially tuberculosis (Marks, Jacobson).
2. Statistical studies of large numbers of eminent men and women and gifted children have led to conclusions such as the following:
   A. That genius is a quantitative, not a qualitative variation from the norm of human intelligence (Terman, Galton, Cattell).
   B. That genius is more likely than not to appear in families having superior social, economic and educational status (Stanford study, Galton, Cattell, Odin, Clarke, Ellis).
   C. That genius is likely to be found in connection with constitutional delicacy of nervous organization, resulting in motor incoördination, a tendency to celibacy, instability and interference with ordinary activities of life (Ellis).
   D. That genius is likely to be accompanied by traits of strength, balance, persistence, and versatility (Stanford study).
3. Studies which have undertaken the special problem of comparing abilities of different sorts have led to the following suggestions:
   A. That differences in temperamental, motor and sensory equipment direct activity into different fields (Hirsch).
   B. That emotion is a dominant characteristic of literary men and that the intellect is a dominant characteristic of scientists (Hirsch).
   C. That excitability, sociality and predisposition to depression are characteristic of literary men; whereas persistence and emotional balance are characteristic of scientists (Cox).
   D. That verbal abilities are characteristic of literary men, non-verbal abilities of scientists (White).
   E. That there is a clustering of concomitant temperamental qualities, and qualities related to temperament, around each discrete ability to form a type, with a "lebensfassung" of its own, lending consistency to and manifesting itself in each item of behavior (Dilthey).

III. THE METHOD

The present study employs the biographical method. Despite obvious drawbacks, foremost of which are the incompleteness and inaccuracies in the available data, and the personal equation which enters into their interpretation, the method has several advantages. It enables us to obtain subjects whose creative ability has been proved and evaluated, and information about them not available from living geniuses. Even should living subjects be employed, our measures would probably not differ essentially from those here obtained, owing to the present inadequacy of laboratory tests, for the traits which concern us. Finally, the biographical method presents the individual as a total personality, making available what the German school of descriptive psychology would call the "lebensform".

Special attempts were made in this study to render the biographical method as objective as possible. The group of literary men studied was limited to poets, novelists, and dramatists; that of scientists to workers in the biological and physical sciences and mathematics. Only men were included. Any scientist or man of letters was selected who had produced some part of his work during the Nineteenth Century and who was mentioned in three out of four standard histories of science and two out of four standard histories of literature.[3] The use of histories of science and literature made it possible to secure expert opinion, the accepted criterion of scientific or literary merit. By limiting the groups to the nineteenth century, it was possible to define to some degree the cultural conditions and standards of the age in which the subjects worked; and to obtain fairly complete biographical information, as well as comparatively stable critical estimates of ability. By this method, the names of 120 scientists and 123 literary men were obtained, samplings large enough to be representative of the two groups.

An outline was devised, covering the major facts in the life and work of an individual. Its contents will appear in the next section, *Results*. The outline was filled out by reading the biographical sketches in the *Encyclopedia Britannica*, three biographical dictionaries devoted to famous men in the entire world,

[3] The names of these histories, as well as of all volumes consulted, may be found in the Master's Thesis, from which this report is abstracted, on file in the library of the University of Minnesota: Raskin, Evelyn, A Comparison of Scientific and Literary Ability: A Biographical Study of Eminent Scientists and Men of Letters of the Nineteenth Century.

and two biographical dictionaries, devoted to men of the particular nationality of the subject. Only when gaps in the biographical material from these sources were present, were individual volumes of biography consulted. This was done in order to standardize as much as possible the quality and quantity of the biographical data.

IV. THE RESULTS

1. *Distribution and Order of Merit.*—The amount of space or number of lines (representative of expert critical evaluation) devoted to each individual in the histories of science and literature was used as the most accurate and objective measure of relative merit. By using not only the histories of science and literature previously mentioned, but also the *Encyclopedia Britannica* and *Lippincott's Biographical Dictionary,* the number of raters in determining this order of merit was increased. The number of lines accorded to each individual in each reference in which the individual was mentioned was divided by the average number of lines per man for that reference. (Found by dividing the total number of lines granted all subjects in that reference by the number of subjects selected from the reference.) The numbers of lines from each reference, now made comparable, were added together to form the sum total number of lines accorded a subject from all the references in which he was mentioned. Since, however, not every individual was mentioned in every reference, each subject was also given a rank within each reference and the rank positions were averaged to obtain a final ranking. There were discrepancies in rank order—some of them rather large—among the different references, a situation which is not surprising since the histories were written from somewhat different points of view and naturally emphasized different lines of activity.

It was discernible, first of all, that on the average, more space was devoted to the discussion of a literary man's life and work than to that of the scientist. In the common reference, the *Encyclopedia Britannica,* almost three times as much space was granted to writers as to scientists. All subsequent findings should be considered in the light of the greater relative prominence given to the life and work of a writer.

An examination of the first twenty-five ranks in each group with the corresponding sum total number of lines indicates a more concentrated clustering for the literary group. Thus we have a

drop of almost 300 lines from the first to the tenth scientist, as against one of 257 lines for literary men. Similarly, we must descend as far as the thirty-sixth rank for the twenty-fifth ranking scientist, and only as far as the thirty-second rank for the literary group. This fact, if taken as its face value, seems to indicate that either fewer scientists reach the peak of eminence than do literary men or that differences among the former are greater.

To bring this question to a clearer focus, the probable error of each subject's average rank was computed by the formula suggested by Cattell: $\frac{.845 \text{ A.D.}}{\sqrt{N-1}}$ The total number of subjects was divided into eleven equal groups and the average rank and P.E. for each group were computed. The average P.E. for the group of scientists was 7.6, as contrasted with 6.6 for literary men. If the size of the P.E. may be considered as inversely proportional to the degree of difference between the individuals, it would appear, contrary to the previous suggestion, that differences among scientists are smaller, or perhaps (and this seems more probable), less discernible as judged by amount of space in critical histories. The sharper descent characterizing the number of lines for scientists is probably explained by the fact that, as a whole, less space is devoted to scientists, so that after the first few individuals, the number of lines drops rapidly. Even though one scientist's achievements are considered superior to another's, he does not receive a proportionately greater amount of space. Histories of science, unlike histories of literature, lay emphasis chiefly upon a man's achievements, rather than upon the individual who produced them.

The trend of the size of P.E.'s (going from highest to lowest rank for the eleven divisions) of the rank positions for both groups presents an interesting finding. For scientists, they are: 3.0, 5.2, 7.4, 7.5, 9.9, 9.7, 10.7, 7.9, 9.2, 7.9, 4.8. For literary men, they run: 1.6, 5.1, 6.7, 7.7, 7.0, 9.0, 8.1, 7.4, 7.4, 9.1, 6.4, 4.9. That is, the P.E.'s are small for the highest ranked individuals, increase in size until the tenth division, and then drop again for the last two divisions of the lowest ranked men. If again, there is an inverse relation between size of P.E. and amount of difference between individuals, then gifted men seem to differ among themselves as much as does a normal sample of people. The most gifted of a gifted group and least gifted of the same group differ

from each other more than does a large central group among whom differences are small, hard to estimate, and unstable.

II. *Longevity and the Creative Span.*—The findings of the study in respect to average length of life, ages at which first, greatest and last work were produced for scientists and literary men are summarized in Table I.

In determining the last three measures, inaccuracies probably appear. The age of first work may either not have been given or have been given incorrectly. Such an error would most likely,

TABLE I

TABLE OF AVERAGE LENGTH OF LIFE AND CREATIVE PERIOD

	Scientists		Writers			Diff.
	Years	σ	Years	σ	Diff.	$\frac{\text{Diff.}}{\sigma \text{ Diff.}}$
Length of life.....	68.6	14.0	63.4	15.0	5.2	3.0
Age of first production....	25.2	4.8	24.2	6.0	.7	1.1
Age of greatest production	35.4	7.8	34.3	7.2	1.1	1.8
Age of last production....	59.4	12	55	14.0	4.4	3.0

however, operate equally on both groups. In selecting the greatest or best work more difficulty was encountered. In general, there is a consensus of opinion as to which of a man's work is his "magnum opus". When, however, more than one published work was alluded to as the individual's finest contribution, the date of the earliest work was selected for both groups.

The outstanding result revealed in Table I is the similarity in the trends for both groups. Both scientists and literary men, according to the averages, live beyond 60 years of age. This exceeds the life-span of the average man, although properly, no comparison can be made, since the latter statistics include the deaths of infants and young children. However, it does suggest the greater energy and "life-force" that the Stanford Group, Hirsch, Galton, Kretschmer, and others have claimed for genius; and also seems to contradict theories of physical inferiority and delicacy. The fact that scientists live five and one-half years longer, on an average, than men of letters may possibly have some relation to the greater balance and superior stability, attributed to them by the Cox study. Our results, in respect to difference in length of life between the two groups are supported by Miss Cox's finding of a similar difference for 39 scientists and 52 literary men, covering the wide span of years from 1450 to 1850.

The course of the creative career is practically identical for the two groups. Both scientists and literary men make their first contribution at about 25 years of age. This is contrary to the

popular notion of the scientist's dependence upon years of study and preparation, and the literary man's chiefly upon inspiration, thus enabling the latter to produce at a much younger age than the scientist.

This uniformity between the two groups is carried out in the age of greatest production, approximately 35 years for both scientists and men of letters. This figure is earlier than the age of 47, found by Thorndike for the age of greatest work. He, however, used all the names from the first 17 volumes of the *Biographical Dictionary,* and where fame rested on several "opera" may have selected the latest instead of the first date as we did. Suggestive also for the psychology of creative thought and of senility is the finding that both groups wrote and produced until within nine years of their death.

It was possible to discover, furthermore, whether there was any relation between the age at which a man produced his first and best work and the amount of available knowledge in his field to be mastered. Thus, we might expect that as scientific knowledge accumulated, the age of first and best creative work would be pushed to a later and later period in an individual's life. Since scientific knowledge was increasing rapidly during the nineteenth century, this question is of especial interest in its bearing on the group of scientists.

The subjects were divided into four groups, according to the year in which they were born: 1735–65; 1765–95; 1795–1825; 1825–60. The four measures, *i.e.,* length of life, first, best, and last work remained unchanged for the four divisions of the hundred-year interval. Thus, while, surely, a scientist born in 1860 had much more to learn than one born in 1735, yet the age of first contribution for scientists of that period was not delayed; and the age of greatest discovery remained at 35 years of age.

The uniformity in our findings for both groups suggests that we may have found a course of creativity, common to creative thinkers, and relatively independent of environment and training. The ability is first definitely shown in the middle twenties, flowers into complete maturity ten years later, and remains active until about a decade prior to death. This course assumes a length of life extending beyond 60 years.

III. *Family Influence and Early Environment.*—For classification of father's profession, a modification of the Taussig scale was employed to fit nineteenth century socio-economic status. The first group consisted of the nobility and gentry; the second of

professional men and men in high government offices; the third of semi-professional men, *i.e.*, those in the civil service, naval and army officers, and managers of large business enterprises; the fourth of skilled laborers, soldiers, sailors, clerical workers and men in petty business enterprises; the fifth of tenant farmers, unskilled laborers and artisans.

Table II summarizes these data. Confirming the findings of most previous studies is our result that the predominance of gifted men come from the three highest socio-economic divisions,

TABLE II

TABLE SHOWING SOCIO-ECONOMIC STATUS OF EMINENT MEN

Fathers' Occupational Status	Scientists N=112	σ	Writers N=122	σ	Diff.	Diff. / σ Diff.
Nobility and gentry	.08	.02	.13	.03	.05	1.2
Professional men.	.47	.04	.41	.04	.06	1.0
Semi-professional men.	.14	.03	.29	.04	.15	3.0
Skilled and clerical workers	.14	.03	.11	.02	.03	.7
Farmers and artisans	.15	.03	.04	.01	.11	2.7

with the professional class, specifically, making the largest contribution. An interesting distinction appears, for while practically 30 per cent of the scientists come from the lowest two classes, only 15 per cent of the literary men do. Indeed, the single occupation which contributes most scientists is farming, as contrasted with law and large business for literary men. An analysis of maternal grandfather's occupation (for 30 scientists and 60 men of letters) duplicated these findings. Again, and significantly enough, there was a stronger tendency for scientists to come from the farmer and artisan classes than for literary men, who came more frequently from the nobility, gentry, and merchant classes.

In this division of our report is included also the age of the father at the birth of the gifted son. For the 38 scientists and 40 men of letters on whom this information was available, the average ages of the fathers were 38 years σ 8 and 40 years σ 9 respectively. These figures correspond closely with the 37 obtained by Ellis and 36 by Galton. It seems, as these writers have maintained, that the age of the father when his gifted son is born tends to exceed the usual age of paternity. Possibly professional men in the nineteenth century, like professional men of today, tended to marry later than men in the population at large.

The possibility of poverty and hardship during youth and maturity is not precluded by the fact that both groups come, for the most part, from the higher classes. Poverty was extreme enough to be mentioned for 29 per cent of the literary men and

15 per cent of the scientists. Our result, that 73 per cent and 85 per cent of writers and scientists respectively are not recorded to have experienced financial hardship, may be considered a finding contrary to the expectations of those who regard genius as something called forth by a struggle against odds, though of course, not all obstacles are financial.

Of our eminent men, 73 per cent of the scientists and 65 per cent of writers received university training, large proportions, which reflect, perhaps, the high socio-economic status from which

TABLE III

TABLE OF PERCENTAGES OF SCIENTISTS AND LITERARY MEN GIVING EVIDENCE OF VARIOUS SOCIAL AND TEMPERMENTAL TRAITS

	Scientists	N	σ	Writers	N	σ	Diff.	Diff. / σ diff.
Marriage	.68	120	.04	.76	123	.03	.08	1.3
Associates	.89	120	.03	.87	123	.03	.02	.5
Recognition	.90	120	.02	.80	123	.03	.10	2.5
Traits of Temperament								
Sociability	.74	47	.06	.54	68	.06	.20	2.0
Emotionality	.50	27	.09	.78	54	.05	.28	2.8
Cheerfulness	.88	120	.03	.46	123	.04	.42	8.4
Modesty	.81	22	.07	.40	32	.08	.41	4.1
Persistence	.100	100	.00	.80	95	.04	.20	5.0
Evidence of Neuroses	.17	120	.03	.46	123	.04	.29	5.0
Poor health (child)	.12	120	.02	.20	123	.03	.08	1.6
Poor health (adult)	.30	120	.04	.35	123	.04	.05	.8
Cause of Death		46			55			
Heart	.24		.06	.10		.04	.14	2.0
Tuberculosis	.15		.05	.20		.05	.05	.7
Paralysis	.15		.05	.20		.05	.05	.7
Pneumonia	.10		.04	.10		.04	.00	.0
Apoplexy	.10		.04	.05		.02	.05	1.0
Cancer	.00		.00	.09		.03	.09	2.2

these men come. Twenty-seven per cent of scientists and 35 per cent of the writers seem to have oriented themselves into their respective fields of eminence without university training.

In summary, then, we have found, in line with previous studies, a uniform tendency for genius in general to come from the professional class, with its concomitant favorable economic and cultural conditions. Our data, however, seem to show a decidedly greater tendency for scientists to come from the lower socio-economic classes than for men of letters to do so.

IV. *Social and Temperamental Traits.*—Among the theories of genius reviewed in Section 2 was the popular one that all men of genius because of organic and social inferiority renounce the practical values of life—work, family, friends, and direct the unspent energy into the channels of creative expression. Table III summarizes the relevant data: marriage, social relations, temperament, instability and health.

Our findings reveal that approximately 70 per cent of gifted men marry, 20 per cent less than the norms for the male population of 1890. This may seem to confirm Herzberg's and Ellis' theory that men of genius tend toward social inadequacy and celibacy. However, we must consider the possibility of omission of mention of marriage, in the biographical accounts, especially in the case of scientists. In any case, it cannot be said that most men of genius failed to conform to the social pattern of their period in this respect, since even the incomplete data available showed that most of them married. Possibly temperamental differences may be inferred from the greater incidence of marriage among literary men, and also from the fact that unhappy marriages are reported five times as frequently for writers as for scientists. The inadequacy of the data on this point must of course be taken into account.

Most gifted men were reported to have had the favorable environmental stimulation of social and intellectual association with men in their own profession, in addition to recognition (awards, financial success, critical acclaim) for their work. According to the data at our disposal, these factors figure less prominently in the lives of literary men than in the lives of scientists. Table III shows differences of about 10 per cent in the item "Recognition".

Turning now to the elusive and subjective traits of personality and temperament, we adopted the following procedure as bringing out most adequately the relevant facts. First, five outstanding traits, which according to the biographical accounts seemed most significant, were selected for study: sociality, emotionality, characteristic mood, attitude toward the self and persistence. Next, these were divided into contrasting pairs of characterizations: social, non-social; emotional, unemotional; egotistical, modest; cheerful, depressed; persevering, irregular in activity. Finally each individual was checked as characterized by one term of each of the contrasting pairs, whenever there occurred a concrete and definite description of the individual in such terms in the biographical sketches. Table III indicates a social, emotional or unemotional, cheerful, modest and persistent scientist, and a social or unsocial, emotional, despondent, egotistic, and persistent poet, novelist and dramatist. This classification is admittedly crude and it is based on a smaller sampling than desirable. Besides the differences may be merely the reflection of the stereotyped personality traits the layman thinks becoming to scientists and literary individuals. Likewise, we are unable to obtain degrees

to which these traits were present, and it is plausible to suppose that the trait was mentioned only when it was marked. Only if these objections are minimized, may it be assumed that there are temperamental types clustering about scientific and literary ability. Supporting this result, however, is Miss Cox's finding, by a somewhat different method, that literary men were more excitable and predisposed to depression.

Subjective factors also enter to a marked degree into any classification of mental disorder from biographical material. Conscious of this, we made definite efforts to approximate objectivity by using a simple four point scale. On this scale, a score of 0 was given if no indications of any instability were present in the material; 1– if definite references were made to such phenomena as nervous breakdowns, hyper-excitability, or visions; 2– if there were concrete reports of dipsomania, attempts at suicide; 3– if a recognizable insanity was described as paranoia, the manic-depressive psychosis or epilepsy. The ease with which the data fell into this classification was surprising. Reclassifying the data a week later resulted in a correlation coefficient of .93.

Our data, as the table shows, do not support the theories of Lombroso, Ellis, de Mours and others regarding the close association between genius and mental instability. However, it is interesting to find that almost one-half of the literary group evince some manifestation of neurotic behavior, as contrasted with the small incidence of 17 per cent of the same kind of behavior for scientists. This appears to be a genuine difference, and is perhaps associated with the temperamental differences found above. Also in line with this conclusion is the greater frequency of poor health for literary men, in both childhood and maturity, a condition possibly associated with mental instability. The greater incidence for literary men of paralysis and tuberculosis (although the difference is not statistically reliable) should be noted. At any rate, the finding that only 30 per cent of the scientists and 35 per cent of literary men are reported to have suffered ill health as adults does not seem to substantiate the theory that genius is abetted or frequently accompanied by ill health and physical inferiority.

Thus, though one cannot say that as a class, men of outstanding ability are characterized by instability, ill health, or social inferiority, there seems to be some justification for differentiating between men of science and men of letters in this respect, the latter as a group being characterized to a greater extent by

emotionality, despondency, neurotic behavior, delicate health, paralysis, and tuberculosis. As a group, it should be recalled, the literary men were not so long-lived as the men of science.

5. *Versatility.*—Under this topic, we survey the evidence for the existence of independent abilities. The investigation accepted as evidence for an outside ability: (*i.e.*, one outside the field in which the person achieved eminence) academic degrees, publications, definite employment in some remunerative activity, and specific aptitudes, exceptional enough to have been noted by the biographer. For 70 scientists and 75 men of letters some such manifestation was recorded and all percentages were computed

TABLE IV

TABLE OF PERCENTAGES OF SCIENTISTS AND LITERARY MEN GIVING EVIDENCE OF VERSATILITY

	Scientists (N=70)	σ		Literary Men (N=75)	σ	Diff.	Diff. / σ diff.*
Professions							
Government positions	.25	.05		.25	.05	.00	.0
Law	.13	.04		.19	.04	.06	1.0
Theology	.08	.03		.05	.02	.03	.7
Outside Abilities							
Art	.17	.04		.16	.04	.01	.1
Music	.08	.03		.05	.02	.03	.7
Language .30 / Creative literature .23	.53	.06	Math. & Science	.10	.03	.43	6.1

* Our differences here are not statistically reliable, except for the large one in language and science. However, we are pointing out trends and indications, rather than final conclusions.

on these numbers. In some cases, a given individual has several outside abilities.

Table IV summarizes these data. The most frequent outside ability of the scientist is found in the field of language, while the outside abilities of literary men are found chiefly in the arts, music, painting, sculpture. Scientists and men of letters were occupied with governmental work, with law, and with theology to almost the same degree. As a class, literary men are not characterized by as much versatility (as we have defined the term) as scientists. Although we can say that more than one-half of the scientists possessed a considerable degree of verbal ability, the authors did not show scientific interests and abilities to an equal degree. Only 10 per cent of men of letters evince scientific ability, although it is their most frequently recorded interest. When disabilities were reported, however, it was found to be language for the scientist and science, especially mathematics, for the literary man. So specific are some of the abilities, according to the

biographies, that it is possible for a biologist to make a poor physicist. The fact that verbal ability seems to be the most frequent correlate of scientific ability may be explained by the fact that scientific ability and writing both require the use of verbal symbols, while literary ability can be relatively independent of specific knowledge of scientific techniques and subject-matter.

6. *Eminent Men of the Highest Rank.*—All of our 120 scientists and 123 men of letters are not claimed to be geniuses of the first rank. To determine whether we were sacrificing qualitative distinctions for statistical reliability, the data were reworked for the 25 scientists and 25 men of letters, ranking highest on our lists.[1]

The outstanding result of this reanalysis was the confirmation of results found in the main study, with an underlining and sharpening of the trends therein revealed.

(1) The average length of life rose from 68 years to 72 years for the scientists and from 63 to 64 for men of letters, thus emphasizing the long-livedness of the group as a whole and the slightly shorter length of life of the literary men. (2) The age of first production was lowered to 22 years, indicating even greater precocity, when only the most eminent are considered. The age of best production remained approximately the same as when the two groups were studied as a whole—in this case, 36 years for scientists and 34 for men of letters. (3) Of the most eminent scientists, 24 per cent, as compared with 15 per cent of the scientific group as a whole, come from the artisan and farmer class, and the semi-professional group contribute most of the literary men of greatest distinction as compared with the professional class which contributed most of the group of literary men as a whole. (4) Incidence of marriage increased to 84 per cent for scientists and 80 per cent for literary men, (from 68 per cent and 76 per cent respectively), also strengthening the evidence for normality in this respect, and casting further doubt upon theories of social and sexual maladjustment, as very frequently associated with genius. (5) The temperamental differences were also accentuated, an increase being present in the evidence for emotionality, despondency and non-perseverance of the literary man, and also in the evidence for the characteristic mood of cheerfulness among

[1] The 25 scientists are: Agassiz, Berthollet, Dalton, Darwin, Davy, Faraday, Gauss, Gay-Lussac, Hamilton, Helmholz, Herschel, Humboldt, Joule, Kelvin, La Grange, La Marck, La Place, Legendre, Liebig, Lyell, Maxwell, Pasteur, Poisson, Riemann, Young.

The 25 literary men are: Balzac, Browning, Byron, Chateaubriand, Coleridge, Cooper, Dickens, Goethe, Hardy, Hawthorne, Heine, Hugo, Ibsen, Irving, James, Keats, Poe, Schiller, Scott, Shelley, Tennyson, Thackeray, Tolstoi, Whitman, Wordsworth.

the scientists. (6) There is an increase in indications of neurotic tendencies for both groups (accompanied by an increase in mention of poor health) but the difference between them is deepened. Only 24 per cent of the most gifted scientists evince some instability, as contrasted with 58 per cent for men of letters. (7) In respect to versatility, the findings on the more inclusive group are somewhat altered, in that while language remains the most frequently reported outside ability of the most eminent scientists, scientific ability is most frequently reported as the outside ability associated with the greatest literary eminence. As regards versatility, as we have defined it, the absolute percentages for both groups are increased.

The accentuating of the results of our main group, as well as the alterations which occur, must be considered in the light of the possible greater completeness and detail in the biographical sketches of the most eminent subjects.

V. SUMMARY

A comparative study of 120 men of science and 123 men of letters was undertaken as "follow-up" and additional research on previous statistical studies of genius and as an attack upon one important phase of the problem recognized but not carried through by these investigations.

1. The following results represent uniform tendencies for the two groups, which may characterize genius in general:
   - A. Men of genius appear to form a group at the upper extreme of the curve of distribution, among whom there are differences, largest and most stable for the least and most gifted members of the gifted population. These two groups flank a large central group, among whom differences are small and difficult to estimate.
   - B. Men of genius live longer than does the average individual. Their life-span, exceeding 60 years, recalls the fact that superior energy and "life-force" have often been attributed to them.
   - C. Creative ability seems first to make itself definitely manifest in the middle twenties, to be at a peak in the middle thirties, and to continue up until within a decade of the individual's death.
   - D. Men of genius are likely to be born in the upper socio-economic classes, a fact reflected in the large percentages of those who attended college and experienced no financial hardships.

E. The average age of the father at the birth of his gifted son was found to be from 38 to 40 years.

F. Our data do *not* substantiate the theories that genius is, as a class, associated with delicate health, tuberculosis, celibacy, or mental instability.

2. Concerning environmental factors, it is possible to make the following distinctions between the two groups.

A. Though both scientists and men of letters come chiefly from the upper socio-economic classes, the two groups differ in that scientists are much more likely than men of letters to come from the farmer and artisan class. For men of letters, the socio-economic class which ranks second to the professional is the semi-professional.

B. For literary men, actual poverty was reported more frequently than for scientists. University training was less common among literary men, as was definite recognition.

3. The following evidence was found for differences in temperament and differences related to temperament between men of letters and men of science:

A. Emotionality, despondency and egotism were more frequently reported for literary men than for scientists; the data also indicate for men of letters a definitely more marked tendency toward instability, a higher incidence of ill health in childhood and maturity, a higher incidence of tuberculosis and a slightly shorter life-span. For scientists, the data indicate greater sociality, cheerfulness, and modesty, a low incidence of instability and ill health in childhood and maturity and a slightly longer life-span.

B. Difference in outside activities, interests and abilities was also reported concerning the two groups. The most frequently reported outside activity for both groups is that associated with occupying some government position. The most frequently reported outside ability for scientists is that of verbal ability; the most frequently reported outside ability for men of letters is artistic ability. When disabilities are mentioned, however, disabilities in language are named for scientists, disabilities in science for men of letters. Within one line of activity, *e.g.*, science, abilities may be reported as very specific, *i.e.*, a biologist reported as a poor physicist. Scientists show more versatility than men of letters, versatility in our study being indicated by definite indications of achievement or recognition in some outside activity.

4. When twenty-five of the most eminent of each of the two groups were studied separately, it was found that the tendencies which characterize eminent scientists in general characterize the most eminent scientists to an even greater degree; similarly, that the

tendencies which characterize eminent men of letters characterize the most eminent literary men to a greater degree than the group in general. That is, the tendencies which appear in the group as a whole appear in accentuated form in the most outstanding representatives of those groups.

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AN OBJECTIVE STUDY OF THE RELATIONSHIP BETWEEN PSYCHOLOGICAL FACTORS AND THE SEVERITY OF STUTTERING *

By MAX DAVIS STEER and WENDELL JOHNSON

IT is the purpose of this investigation to ascertain the variations in severity of stuttering associated with known variations in the speech situation. It is a further purpose to ascertain the variations in severity of stuttering associated with known variations in the stutterer's psychological reactions to the speech situation.

It is generally believed that psychological and social factors associated with the speech situation determine in large part the nature of the speech performance of the stutterer. So far as the present writers are aware, however, this problem has never been attacked directly in a satisfactorily objective manner.†

I. METHOD

Since this study constitutes the first attempt known to the writers to obtain quantitative measurements of the severity of stuttering and of the emotional and psychological reactions to stuttering in ordinary speaking situations, and since such measurements are of basic importance, it seems advisable to discuss in some detail the problem of method.‡

The severity of stuttering may be defined from at least six points of view. It may be thought of in terms of frequency of stuttering spasms; the average intensity or severity of the spasm; and the time required by the stutterer to utter a given number of words. It may also be thought of in terms of the functional disturbances associated with the stutterer's attempt to speak, such as irregularities in breathing, in action current patterns, in pulse rate and in other aspects of bodily function. Also, it may be thought of in terms of the stutterer's effectiveness in achieving communication. And finally, it may be considered in terms of the

* Received and acknowledged December 14, 1934.

† Studies by Travis (6), McDowell (5) and Johnson (2, 3, 4) bear indirectly upon the problem, and a study by Bryngelson (1) bears directly but in a general way upon it.

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general handicap under which the stutterer labors; this handicap may be due not only to the stuttering spasms themselves but also to the attitude of the stutterer toward his speech disorder.

Of these six aspects of the severity of stuttering there are only two which lend themselves to quantitative measurement in ordinary speech situations. There are no facilities available for measuring adequately the effectiveness of communication, or the stutterer's general handicap. And for the measurement of the intensity or duration of individual spasms, or the functional disturbances associated with stuttering, it would be necessary to use apparatus which would render the speech situations artificial to a high degree. It is possible, however, to record the frequency of overt stuttering spasms and the time required for the stutterer to utter a given number of words. And it is possible to do this in speech situations that are relatively natural. Preliminary experimentation showed, however, that only by using oral reading could valid time records and records of the spasm frequency be secured.

In order to ascertain as adequately as possible the factors associated with changes in the severity of stuttering, three precautions were taken. First, each stutterer was made thoroughly familiar with the reading passage used before he was observed in any of the experimental situations; and the same reading passage was used for all of the subjects throughout the investigation. In this way, possible changes in the stutterer's speaking performances due to changes or differences of reading material was avoided. Second, the objective nature of each speech situation was made constant for all subjects. Third, records of the stutterer's emotional and psychological reactions in each situation were obtained.

Moreover, these records of emotional and psychological reaction were quantitative and covered specific points. The records were in the form of categorized and graded introspections. The specific types of attitudes and reactions, concerning which introspections were obtained, were selected from a larger list of possibilities. These selections were based upon the results of questioning of stutterers regarding the nature of their experiences during stuttering. Also, results of two previous studies were utilized (3), (4).

In obtaining the introspections the principle of the rating scale was used for two reasons. In the first place, preliminary work showed that unquantitative statements of attitudes or reactions were unsatisfactory for purposes of quantitative analysis. In the second place, by obtaining ratings of specific types of atti-

E. The average age of the father at the birth of his gifted son was found to be from 38 to 40 years.

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In order to ascertain as adequately as possible the factors associated with changes in the severity of stuttering, three precautions were taken. First, each stutterer was made thoroughly familiar with the reading passage used before he was observed in any of the experimental situations; and the same reading passage was used for all of the subjects throughout the investigation. In this way, possible changes in the stutterer's speaking performances due to changes or differences of reading material was avoided. Second, the objective nature of each speech situation was made constant for all subjects. Third, records of the stutterer's emotional and psychological reactions in each situation were obtained.

Moreover, these records of emotional and psychological reaction were quantitative and covered specific points. The records were in the form of categorized and graded introspections. The specific types of attitudes and reactions, concerning which introspections were obtained, were selected from a larger list of possibilities. These selections were based upon the results of questioning of stutterers regarding the nature of their experiences during stuttering. Also, results of two previous studies were utilized (3), (4).

In obtaining the introspections the principle of the rating scale was used for two reasons. In the first place, preliminary work showed that unquantitative statements of attitudes or reactions were unsatisfactory for purposes of quantitative analysis. In the second place, by obtaining ratings of specific types of atti-

tudes and reactions, it was possible to obtain introspections that were comparable for all subjects and for all situations.

Introspections were obtained immediately after each speech performance, by having the subject rate on a five-point scale each of the following: general emotional reaction; intensity of desire to talk without stuttering; embarrassment; embarrassment of the audience—as it seemed to the stutterer; degree to which the audience was friendly or unfriendly—as it seemed to the stutterer; clearness of the stutterer's vision of the audience; degree to which the audience regarded the stutterer as an inferior or as a superior individual—as it seemed to the stutterer; degree to which the audience was appreciative of the "stutterer's point of view"—as it seemed to the stutterer; and the amount of effort and muscular strain experienced by the stutterer while speaking. There was a separate rating scale with each scale step defined, for each item rated.

Ten male stutterers in attendance at the State University of Iowa Speech Clinic were used as subjects in this investigation. They ranged in age from seventeen to twenty-three years, the average age being 21.1 years.

First of all, each subject was given a typewritten copy of William Allen White's Pulitzer Prize Essay, "To an Anxious Friend". He was then directed to an empty room and instructed to read the essay aloud five times, employing his usual reading rate. This essay contains 344 words.

Following this rehearsal the subject read the essay aloud in each of fifteen standardized speech situations. The situations were designed to represent a considerable range of conditions for speech, to contain a minimum of artificiality, and to allow for the obtaining of the desired measurements.

The following situations were used:* (1) Mr. Steer, experimenter; (2) alone with a stop-watch; (3) telephone disconnected; (4) telephone to a male student; (5) telephone to a coed; (6) two stutterers; (7) microphone disconnected; (8) microphone connected; (9) class of stutterers; (10) alone in a room with a camouflaged microphone by means of which speech was recorded on a phonograph record without stutterer's knowledge; (11) phonograph recording of the reading with stutterer's knowledge; (12) faculty member; (13) male student; (14) coed; (15) male student and coed.

The first six performances were executed in consecutive order

* Detailed descriptions of the fifteen test situations and of the procedure followed in each is on file in the State University of Iowa Library.

by all subjects. The order of the remaining nine performances was dependent upon the availability of the situations.

Each of eight subjects completed the readings within a single day from 9:00 A.M. to 4:30 P.M. Two subjects required more than one day to complete the experiment. The selection of a day to complete the study of these individuals was determined by their ability to give performances comparable to those of the first day. The first two situations were used as the basis for comparison.

It seems necessary to point out that the techniques which are most commonly used for determining the reliability of measurements are not so appropriate with reference to the reliability of

TABLE I.

NUMBER OF SPASMS RECORDED BY THREE CLINICIANS AND THE EXPERIMENTER WHILE LISTENING TO FIVE STUTTERS

Case	A	B	C	Experimenter
V	4 spasms	4 spasms	3 spasms	6 spasms
X	2 "	2 "	1 "	3 "
III	1 "	0 "	0 "	1 "
VI	11 "	12 "	12 "	14 "
II	3 "	3 "	3 "	3 "

spasm frequency records. First, the test-retest method would yield not so much an indication of the experimenter's ability to count stuttering spasms with accuracy, but rather an indication of the stutterer's consistency in experiencing spasms. Second, correlating one-half of a reading performance with the other half would have yielded essentially the same sort of indication. In order to make this clear, we may cite a specific instance. During one performance, Case X experienced no spasms at all during the first three-fourths of the reading and then went on to have fifteen spasms while reading the last one-fourth of the passage.

Comparisons between the experimenter's spasm count and the spasm count recorded by one or more other observers have a limited significance. A few such comparisons, therefore, were made. Five of the ten subjects read the essay before three trained speech clinicians and the experimenter, who counted the overt spasms. The results are presented in Table I.

These figures answer two questions regarding the reliability of the spasm frequency records. In the first place, they indicate that overt stuttering spasms are to be detected with essential uniformity by relatively comparable observers. This is shown by the consistently close agreement among observers A, B, and C, who were familiar with the phenomena of stuttering but who were unaccustomed to counting stuttering spasms. In the second place,

the figures indicate that the experimenter was apparently more skilful in detecting spasms since he consistently recorded a relatively larger number of them than did the other three observers. Beyond this point the figures probably bear no close relation to the matter of the reliability of the spasm frequency records, for we are interested not so much in the degree to which the experimenter agrees with other observers, but more in the experimenter's skill as an individual observer.

There remain two outstanding reasons for accepting the spasm frequency records as being essentially reliable. First, we may reasonably assume that in the course of making observations of stuttering spasms in a large number of speaking situations the experimenter would develop a relatively high degree of skill. Second, since all of the spasm frequency records were obtained by one and the same observer, the experimenter, it is reasonable to assume that any sources of error were relatively constant as far as each subject was concerned.

The raw measurements showed the time in seconds required by each stutterer to read the essay in each situation, and the percentage of the words upon which each subject stuttered in each situation. There were fifteen measurements of each type for each subject. These raw measurements were reduced to derived scores, in order to utilize the data to the fullest advantage. These units or derived scores will be referred to as D.S. units.*

II. RESULTS

I. Do stutterers have more overt stuttering spasms in some types of speech situations than in others?

Fundamental as this question is, to the best of the writers' knowledge, it has never been answered in quantitative terms. On the basis of the present data, it is possible to answer the question in two ways.

First, by averaging the D.S. units of the ten stutterers for each situation, the fifteen situations may be ranked in order of the

* The average frequency of spasm and the average reading time were computed for each stutterer. Point deviations were then obtained by subtracting each record of spasm frequency and time from the corresponding average. All the point deviations were added and an average point deviation was obtained. The derived scores are expressions of the point deviations divided by the average point deviation.

$$\text{Derived scores} = \frac{\text{Pt. Dev.}}{\text{Av.Pt.Dev.}}$$

Professor E. F. Lindquist assisted in the statistical treatment of the data.

relative amount of stuttering exhibited in each, as measured by noting frequency of spasms.*

In Table II the situations are so ranked.

The range of average D.S. units as indicated in Table II is from −.835 to 1.188 or 2.023 average D.S. units. The precise order of rank of these situations is not as important as the fact that considerably more stuttering occurred in some situations than in others.

Second, it is possible to answer the above question by examining the individual records for each subject. These records indi-

TABLE II

RANK OF SITUATIONS IN ORDER OF SEVERITY OF STUTTERING FROM LEAST TO GREATEST

Rank	Situation	Average in D.S. Units
1	X (Unknown photograph record)	—.835
2	II (Alone with stop-watch)	—.664
3	III (Telephone disconnected)	—.651
4	I (Steer—experimenter)	—.574
5	VII (Microphone disconnected)	—.516
6	VIII (Microphone connected)	—.226
7	IV (Telephone to male)	—.023
8	XII (Faculty member)	—.007
9	XIV (Female)	.062
10	VI (Two stutterers)	.157
11	XIII (Male)	.260
12	XV (Male and female)	.349
13	XI (Phonograph record)	.465
14	V (Telephone to a female)	1.083
15	IX (Class of stutterers)	1.188

cate the range of spasm frequency for each subject. These ranges are presented in Table III.

Each of seven stutterers presented no overt spasms at all in one or more of the situations, although these same seven subjects stuttered on from 0.34 per cent to 11.04 per cent of the words uttered in other situations. The range of the percentage of the words upon which stuttering occurred varied from 0.00 per cent −0.34 per cent to 0.00 per cent − 11.04 per cent. As examples of the variation of speech performance from situation to situation, Subject I had approximately eleven times more spasms when telephoning to a male than he had when alone with a stop-watch, and Subject VIII had approximately thirteen times more spasms

* Analysis of the data revealed that nothing could be gained by reporting results with regard to severity of stuttering in terms of the reading time records. They pointed to practically the same conclusions as did the spasm frequency records, and the latter were used because obviously they constituted a more direct measurement of severity of stuttering.

in reading to a faculty member than he did in reading to the experimenter.

The variation in speech performance from situation to situation may be expressed by saying that the average size of the range in percentage of spasms, as shown in Table III, is 4.83 percentage units.

II. What are the objective factors associated with greater or lesser severity of stuttering?

To answer this question it is necessary only to examine the conditions present in the various speaking situations. For purposes of analysis the five high ranking situations in Table II were compared with the five low ranking situations on the basis of the size of the audience and the nature of the audience.

Briefly, the least stuttering occurred in situations in which there was either a familiar audience (of one person) or no audi-

TABLE III

RANGE OF SPASM FREQUENCY EXPRESSED IN PERCENTAGE OF WORDS ON WHICH STUTTERING OCCURRED

Subject	Spasm Frequency Range in Per Cents	Extent of Range in Per Cents
I	1.10 to 11.60	10.50
II	0.00 to 2.32	2.32
III	0.00 to 1.74	1.74
IV	0.00 to 11.04	11.04
V	0.00 to 0.34	0.34
VI	0.00 to 5.23	5.23
VII	0.00 to 1.74	1.74
VIII	0.29 to 7.84	7.55
IX	0.29 to 3.70	3.41
X	0.00 to 4.36	4.36
	Average Range	4.82

ence at all. The most stuttering occurred in situations in which the audience was unfamiliar, or indefinite (phonograph recording), or relatively large (two to at least eight persons).

III. What are the subjective factors associated with greater or lesser severity of stuttering?

This question may be answered in two ways on the basis of the present data. First, it is possible to find the correlation between the introspective ratings and the spasm frequency for all the subjects in all the situations.

The correlation between Introspection I and frequency of spasm is –.3969 with a probable error of .0688. This correlation tends to suggest that an increase in intensity of the general emotional reaction may be associated with an increase in the frequency with which spasms occur.

The correlation between Introspection II and frequency of spasm is –.3582 with a probable error of .0711. This correlation tends to suggest that an increase in the stutterer's desire to talk without stuttering may be associated with an increase in the frequency with which spasms occur.

The correlation between Introspection III and frequency of spasm is –.3504 with a probable error of .0716. This correlation tends to suggest that the degree of the stutterer's embarrassment may stand in positive relationship to the severity of his stuttering as indicated by the frequency of spasms.

This correlation between Introspection IV and frequency of spasm is –.3008 with a probable error of .0938. This correlation tends to suggest that the degree to which the stutterer senses the real or imagined embarrassment of his audience may bear a positive relationship to the severity of his stuttering.

The correlation between frequency of spasm and introspections V, VI, VII, and VIII are respectively .0282 with a probable error of .1025; –.1517 with a probable error of .1004; .2680 with a probable error of .0962; and –.0917 with a probable error of .1024. None of these correlations is statistically significant. It can only be said, therefore, that insofar as these findings are acceptable the severity of stuttering does not seem to be significantly related to (1) the stutterer's opinion as to whether the audience is friendly or critical; (2) the relative clearness of the stutterer's vision of the audience; (3) the opinion of the stutterer as to whether the audience regards him as a superior or inferior person; and (4) the stutterer's opinion as to whether the audience is appreciative or unappreciative of the stutterer's "point of view".

The correlation between Introspection IX, and frequency of spasm is –.4427 with a probable error of .0617. This correlation tends to suggest that relatively greater amounts of effort and muscular strain may be associated with relatively greater frequency of stuttering spasms.

There is a second way of answering the question as to the relationship between subjective factors and the severity of stuttering. It is possible to determine the frequencies of spasm as expressed in D.S. units which are associated with introspective ratings of the values of 5, 4, 3, 2, and 1 respectively. For purposes of this analysis we have used only the ratings for Introspections I, II, III, IV, and IX, inasmuch as the ratings for the other four introspections do not show statistically significant correlation with severity of stuttering and are, therefore, irrelevant to this analy-

sis. We have found the frequency of occurrence of each introspective scale value, using the five significant introspections. We have then computed the average spasm frequency as expressed in D.S. units associated with each introspective rating value. This analysis is represented in Table IV.

Table IV indicates that greater intensity of the combined emotional and psychological reactions tends to be associated with

TABLE IV

SPASM FREQUENCIES ASSOCIATED WITH VARIOUS INTROSPECTIVE RATING VALUES

Scale Value of Introspection	Frequency of Occurrence	Average Spasm in D.S. Units
1	41	1.10
2	114	.75
3	162	.12
4	130	—.15
5	247	—.43
	694 Introspections	

increased frequency of stuttering spasms. The range of introspective rating values from 5 to 1 is associated with a range of spasm frequency of 1.53 D.S. units.

III. CONCLUSIONS

The findings here reported indicate that stutterers experience a measurably greater amount of stuttering in some types of speech situations than in others, and that stutterers experience relatively more difficulty in situations in which the audience is relatively large and consists to a high degree of persons with whom the stutterer is unacquainted. They also suggest that changes in the following subjective factors may be significantly related to changes in severity of stuttering: (1) general emotionality; (2) desire to keep from stuttering; (3) embarrassment; (4) awareness of real or imagined embarrassment on the part of the audience; and (5) effort and muscular strain. There is no intention here to imply that other subjective factors not touched upon in this study do or do not bear any relation to severity of stuttering. Also, it is not possible to conclude from this study that the subjective factors mentioned above are of primary rather than secondary importance in the relationship which they bear to the severity of stuttering; nor is it possible to conclude that the subjective factors are causally related to severity of stuttering.

It is not to be overlooked that the five low but positive correlations having statistical significance, together with the finding

that more stuttering does occur in some situations than in others, are consistent in that they all point toward a common implication: changes in emotional and psychological conditions in the stutterer are probably associated with changes in severity of stuttering. Emotional changes are subtle; our methods of measuring them were crude, even though they appeared to be the best for our purposes. The fact that the findings were consistent strongly indicates that the suggested conclusions are valid. More research is needed, however, before the conclusions here indicated can be accepted as reliable.

There is great necessity for the realization that these data, insufficient as they are, constitute practically the only research support for the belief that emotionality is associated with severity of stuttering. In view of this fact, the vigor with which this belief has been set forth, even by psychologists of supposedly rigorous scientific habits of thinking, is unbelievably absurd.

It is obvious to any student of the subject that stuttering is a matter of organic function, that it is specifically a matter of the function of muscles, nerves, and the brain. There is nothing in the results of this study which implies any contradiction of that statement. However, the results of this study, in spite of the fact that, in large measure, they are merely suggestive, do imply that in regarding stuttering as a matter of organic function, it is necessary to take into account the degree to which the organic function involved in stuttering is affected by subjective factors.

A clue as to how this may be done is contained in a statement by Johnson, based upon previous research: "Influences which serve to bring about or to increase the disintegration of the cortical gradients responsible for speech may be considered as accessory or contributing causes of stuttering. It is at this point that the importance of emotional disturbance becomes apparent. The gap between emotion and the stuttering which it sometimes apparently aggravates may be bridged by saying that if emotion ever causes or aggravates stuttering, it must evidently do so by virtue of its effect upon the gradients responsible for speech" (2, pp. 92–93).

The results of this study tend consistently to suggest a positive relationship between emotional and psychological reactions and the severity of stuttering, and to bring into focus the necessity of accounting for this relationship either in terms of the above quotation or in some other terms.

The results of this study have one other implication of very basic significance. In examining previous studies of the sympto-

matology of stuttering it appears that these studies have evidently been conducted on the assumption that stuttering is a totally unanalyzable process, and the symptoms discovered have been spoken of simply as symptoms of stuttering. That is to say, no distinction has been drawn between the stuttering spasm itself and the emotional conditions, with their accompanying bodily changes, associated with the stuttering spasm. The results of the present study are sufficient to make it reasonably apparent that such a distinction must be made in any adequate discussion of the symptomatology of stuttering. If emotional and psychological factors are operating during stuttering, it is necessary to demonstrate the degree to which irregularities in breathing, vocalization, and articulation are truly symptoms of the stuttering spasm and the degree to which they are symptoms of emotional and psychological conditions.

To put it in more basic terms, it is necessary to distinguish between the instability of the stutterer's speech mechanism which is due entirely to fundamental constitutional factors, and the instability of the stutterer's speech mechanism which is due to superimposed and transitory emotional and psychological factors.

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PERSONALITY AND MODESTY *

By EDWIN G. FLEMMING, PH.D.

ARISTOTLE did not throw much light upon the question of modesty. He says that modesty is not a virtue but that the modest person is praised as if he were virtuous. For him modesty is an emotion of which modesty is the mean while bashfulness and shamelessness are the two extremes. Today we are inclined to consider conceit also as an absence of modesty, while Aristotle places conceit or vanity as the terminus of a series in which high-mindedness is the mean and little-mindedness or mean-mindedness is the other extreme.

I have heard some educators, while discussing the problems of character education and personality recommendations for entrance to college insist vehemently that modesty is a most important trait to be fostered. On the other hand I have also heard teachers in the colleges and universities argue that conceit was more desirable than its opposite, giving the impression that they considered modesty a not altogether desirable characteristic. They insist that the conceited at least attempt to do something to show their superiority while the modest are inclined to refrain from activity beyond the requirements of duty.

One wonders in this age of advertising and personal press agents whether Emerson was really right about his man with a better rat trap, or whether the injunction not to hide your light under a bushel is a more sensible basis for conduct.

The purpose of this study is to try to find out what other traits of personality or character are associated with modesty in order to throw some light upon the question of the desirability of fostering modesty through education whether in the home or in the school.

I have made no attempt to define modesty nor any of the other terms used, but have proceeded on the assumption that we do judge people and characterize them without first stopping to define our terms, and that intelligent people use words with general accord and understanding in their basic meaning. It also seems unwise to give special and unique definitions which would

* Received and acknowledged November 20, 1934.

place terms in a technical vocabulary with meanings not generally accepted in intelligent conversation. Indeed, it is partly through inquiry without definition that we finally arrive at that state of knowledge when we can define with some degree of stability in the definition and some assurance of general acceptance of the description of the term. If any statistical data are gathered on the basis of our assumption which show any definite tendencies of association the assumption is justified, since any great and various discrepancy in the understanding of the terms used would yield coefficients close to zero, the coefficient of chance.

The subjects were eighty-four girls of the Horace Mann High School for Girls, Teachers College, Columbia University, comprising the junior and senior classes.*

The teachers of these girls were given lists of forty-six traits, including modesty, and asked to check for each girl each item that could be attributed to the particular girl. The traits are given in Table 1.

It is obvious from the manner in which ratings on these traits were secured that those who were checked as modest were not necessarily bashful, shy, or mean-minded. Nor were those not checked as modest necessarily shameless, vain, or conceited. It is simply that their personalities and actions were such that they were not characterized as modest.

At least three teachers checked a list for each girl, while in a few cases six teachers gave ratings for a particular girl. The average number of lists checked per girl was 3.6. Since each check list was the reaction of a different person to an individual we might consider the traits checked on each list as representing a distinct personality. In that case there was a total of three hundred and three personalities analyzed.

In addition, each girl indicated on a scale of ten the intensity of pleasant feelings that she subjectively associated with every other girl of her class. This gave me a measure of what may be termed the pleasingness of the personality of each girl. There was an average of over thirty-five ratings for each girl on this factor of pleasingness.

The teachers also on a scale of ten indicated the amount of personality that each girl possessed, when the term is used in

* It is necessary that I acknowledge my indebtedness to Dr. Cecile White Flemming, director of the division of pupil adjustment of the Horace Mann School, who gathered the data which made this study possible, and to express appreciation for the coöperation of the teachers and girls in the school who participated in this inquiry.

such an expression as, "She has a great deal of personality." For this measure there were not fewer than three ratings for each girl. The average rating was taken as the measure of personality.

The method of determining the degree of association between modest and the other traits and characteristics was by means of

TABLE 1

SHOWING IN ORDER OF SIGNIFICANCE, THE TETRACHORIC COEFFICIENTS OF CORRELATION BETWEEN MODESTY AND OTHER TRAITS AND CHARACTERISTICS

Is sincere	.70
Is dependable	.69
Is considerate of others	.67
Is natural, unaffected	.61
Is generous	.61
Is courteous	.61
Is loyal	.53
Is unselfish	.52
Is helpful	.51
Is tolerant	.50
Is sympathetic	.48
Is fair	.48
Is good natured	.47
Is honest	.47
Is tactful	.47
Is industrious	.46
Has good judgment	.46
Is not easily excited	.46
Is neat	.44
Is understanding	.42
Is cultured	.40
Is idealistic	.34
Is adaptable	.34
Has a pleasant voice	.31
Is competent	.30
Has a smiling countenance	.28
Is a "good sport"	.21
Is beautiful or pretty	.21
Is frank	.21
Is well informed	.15
Has wide interests	.15
Is athletic	.14
Is sociable	.12
Has a sense of humor	.08
Is attractive in personal appearance	.08
Is amusing	—.02
Is interesting in conversation	—.03
Is entertaining	—.04
Has individuality	—.05
Is talented in some field of art	—.07
Is original	—.09
Is clever	—.10
Is witty	—.18
Is intelligent	—.20
Is lively	—.25

the Thurstone computing diagrams for securing the tetrachoric coefficient of correlation.*

RESULTS

The tetrachoric coefficient of correlation between modesty and personality as rated by the teachers is .05. Between modesty and pleasing personality as rated by the girls the coefficient is .03.

Apparently there is no relation between modesty and personality as the term is commonly used in the expression, "She has a great deal of personality", nor between modesty and one's pleasingness to his contemporaries. This conclusion does not, however, warrant us in stating a similar conclusion about the extremes of behavior on either side of modest. We cannot necessarily say that since modesty has no relation to personality therefore vanity, conceit, shyness, bashfulness, and shamelessness likewise bear no relation to it and are immaterial factors in personality development. Indeed, there is some evidence from an unpublished study that conceit is one of the most important factors tending to make the individual disliked by others, or, in other words, a major contributor to an unpleasant personality.

It is quite possible that with a group of subjects chosen more at random than the girls in this study a definite relationship would be found between modesty and personality or pleasingness. This particular group of girls is on the average higher in intelligence than a group randomly selected. Their social, economic, and cultural backgrounds likewise are above the average. Yet, since forty-eight and a half per cent of these girls were checked as modest it is about what we would expect even among a more randomly selected group.

The tetrachoric correlation between modest and each of the traits in the check list presented to the teachers are indicated in Table 1. It is of importance that ten of these traits show coefficients of .50 or more, indicating a definite tendency for these traits to be closely associated with modesty. These ten traits are sincere, dependable, considerate of others, natural or unaffected, generous, courteous, loyal, unselfish, helpful, and tolerant. The range of coefficients for these ten traits is from .50 to .70. It is probable that the next eleven traits also, ranging from coefficients of .40 to .48 are significantly related to modesty. They are sympathetic,

* Leone Chesire, Milton Saffir, L. L. Thurstone, Computing Diagrams for the Tetrachoric Correlation Coefficient, distributed by The University of Chicago Bookstore, Chicago, Ill. 1933.

fair, good natured, honest, tactful, industrious, good judgment, not easily excited, neat, understanding, and cultured.

That there is a causal relation between modesty and these twenty-one traits significantly associated with it is not necessarily demonstrated. It would be nice to believe that in order to develop these twenty-one desirable characteristics all we would have to do would be to emphasize the acquisition of modesty. The probabilities are that modesty is one of the manifestations, along with the twenty-one other traits, of a fundamental type of personality and a philosophy of living or attitude towards life and its social accompaniments characteristic of those living in a relatively high cultural strata of civilization. It is probable that for best results in character education and personality development as much emphasis must be placed upon the traits associated with modesty as upon modesty itself. The fact of definite association would simply indicate that there is the possibility of securing the desired results through a variety of emphases and by the avoidance of a reiteration that might be characterized as harping.

But the fact of such definite association with so many other desirable characteristics must not carry us away from a consideration of possible limitations of the ideal of modesty as a penchant for our youth. The ten negative coefficients at the bottom of the list in Table 1, although none of them is particularly high, must be reckoned with.

As we read over the traits positively associated with modesty we get a nice syndrome, as it were, of characteristics portraying the type of person with whom it is very pleasant to live, but who is also likely to be subject to the easy exploitation of the more energetic and selfish. On the other hand, the ten traits negatively associated with modesty give us a picture of a lively, energetic, and interesting person who is likely to present the more romantic and stimulating aspects of life and to lend color to the drab monotony of a blameless and commonplace existence.

Such a violent contrast makes us wonder whether the lack of modesty is not associated with the supremely artistic, intelligent, clever, original persons to a greater extent than is indicated by the low negative coefficients found in this study. Of course, it is not necessarily so. Yet it is possible that a study of a wider range of intelligence, talent, and competence may show that the superior persons cannot generally be said to have the attribute of modesty. It is interesting to note in this connection that, in

another study of these same eighty-four girls,* I found a tetrachoric coefficient of correlation of —.19 between modesty and leadership as indicated by the number and importance of positions held during three years of high school.

It may be inevitable that the superior, justly conscious of their superiority, and properly presenting themselves for service beneficial to their communities, are likely not to be judged modest. It may be that the generally accepted meaning of the term, modesty, is certain to bring the superior into the category of the immodest. But it may also be that in the final analysis and judgment we must take into consideration Aristotle's description of the high minded man when we are called upon to attribute modesty or lack of modesty to the recognizably superior. One who is worthy of small things and who regards himself as worthy of them is temperate, sensible, or modest, but he is not high minded. He who regards himself as worthy of high things and is unworthy of them is conceited or immodest. The high minded person, however, is worthy of high things and estimates his own deserts aright. Should he lean towards modesty and thereby underestimate his deserts he would be unworthy of his great talents and the esteem of others, for then he would be mean minded in taking too low a view of his own worth.

Modesty, then, as we ordinarily know it, probably is a desirable characteristic making for docility in the general run of mankind who have no special talent or merit and must forever be classed among the backbone of the country. But for the superior, for the high minded, for him who regards himself as worthy of high things and is worthy of them, and especially if he is worthy of the highest things, he may have to be prepared to suffer accusations of immodesty and learn to disregard them considering them unworthy the attention of a high minded man.

* Flemming, Edwin G., A Factor Analysis of the Personality of High School Leaders. Jr. of Ap. Psychol., XIX, 5, Oct. 1935, pp. 596–605.

THE ADMINISTRATION OF NON-LANGUAGE INTELLIGENCE TESTS TO MEXICANS *

By THOMAS R. GARTH, THOMAS H. ELSON, AND MARGARET M. MORTON
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THE purpose of this investigation was to secure a satisfactory measure of the intelligence of Mexican children with a reliable non-language test in a city environment in the United States. At the same time we desired to ascertain what the same children would do when they were tested with a verbal test and with an educational achievement test. The larger objective was to determine what influence language and education have on such children when their ability with non-language intelligence test is known. The tests used in this study were the Pintner Non-Language Intelligence Test and the Otis Classification Test, which tests both intelligence and achievement.

In order to carry out the investigation, arrangements were made with the educational authorities of the Los Angeles city schools to administer these tests, under the supervision of Mr. Thomas H. Elson, to Mexican children in various schools of the city.

There were 455 Mexican children tested, who were taken as they were found from the fourth through the eighth grades, whose ages ranged from eight to sixteen years. See Tables I and II.

An examination of Table I with particular reference to the overlapping will show that these Mexican children are almost consistently inferior to the average American white child in both the verbal intelligence and achievement tests when taken age by age. The exception is found in the ninth and tenth years where the groups are small. But with non-language test performance they compare favorably with the American white when the groups are large enough upon which to base a conclusion. These facts are also represented in Figure 1, where a graphic comparison of the average scores is given.

Table II(3) shows that for a school grade the Mexicans are chronologically older than the American whites in the respective grade, the range of difference being from one to two years. This

* Received and acknowledged August 10, 1934.

table provides the average scores for a grade, and it will be seen that when scores have been turned into approximate mental ages, the mental age for Pintner Non-Language score is favorable to the Mexican child though the results for the verbal tests are unfavorable(1)

I.Q.'s have been secured from the approximate ages obtained by the two intelligence tests. It will be seen, Table II, that while

TABLE I

SHOWING AGE COMPOSITE OF GROUP SCORES FOR THE TESTS, NORMS, AND OVERLAP

		Pint. Non-Lang. Score		Otis I Score		Otis II Score		Pint. Non-Language		Otis I		Otis II	
Yrs.	No.	Ave.	S.D.	Ave.	S.D.	Ave.	S.D.	Amer. White Norm	% Mex. o'lap.	Amer. White Norm	% Mex. o'lap.	Amer. White Norm	% Mex. o'lap.
8	1												
9	7	295.9	45.2	24.5	7.6	20.2	4.9	224	93	16	83	15	79
10	59	310.1	61.6	25.4	13.0	20.9	11.9	262	80	26	43	23	36
11	133	329.4	64.0	23.8	10.9	18.3	9.9	304	62	36	16	31	13
12	162	347.3	78.6	28.4	13.4	23.1	12.3	329	57	45	12	38	15
13	87	352.1	64.7	32.1	14.4	25.9	13.2	356	51	53	8	44	12
14	60	396.2	67.9	35.5	14.0	28.2	13.7	378	60	59	5	49	8
15	26	411.0	75.4	44.1	13.4	36.0	12.6	416	45	63	10	53	12
16	10	379.5	77.3	40.5	16.6	33.3	13.7	446	13	67	3	56	8
Total	455												

TABLE II

SHOWING GRADE COMPOSITE, AGES, SCORES AND DERIVED MENTAL AGES AND I.Q.'S FOR THE 455 MEXICANS

Grade	4	5	6	7	8	
Number	128	156	174	58	29	
Chron. Age						
Ave.	11.7	12.0	12.9	14.0	14.9	
S.D.	1.2	1.1	1.2	1.3	1.0	
Pintner Score						
Ave.	291	332	364	427	415	
S.D.	55.5	60.6	63.6	66.2	70.8	
Otis I Score						
Ave.	15.3	25.5	35.0	39.5	55.2	
S.D.	6.8	9.1	10.6	11.3	11.4	
% O'lap on White Norm	9	12	16	12	64	
Otis II Score						
Ave.	12.4	19.2	28.6	34.8	40.0	
S.D.	6.2	7.9	10.8	14.0	12.8	
% O'lap on White Norm	7	8	16	30	28	
Mental Age						
By Pintner—Med.	11.3	11.9	13.0	16.3	15.3	
% O'lap	95	94	91	91	72	
By Otis II—Med.	8.6	9.5	10.5	11.6	13.1	
% O'lap	35	28	38	45	55	
I.Q.						Total
By Pintner Test—Med.	94	101.1	102.6	113.3	102.5	100.8
% O'lap	35	52	54	74	55	51
By Otis II Test—Med.	74.3	79.2	83.1	82.9	87.5	79.5
% O'lap	1.5	8	13	28	21	11

the I.Q.'s obtained for the verbal test results range from 74 in the fourth grade to 87 in the eighth grade, with an average I.Q. for the total group of 79.5,(2) the I.Q.'s obtained for the non-language intelligence test range from 94 in the fourth grade to 113.3 in the seventh grade, with an average I.Q. for the total group of 100.8. While the I.Q. results from the verbal test are such as have been often found for Mexicans in the United States, the results from the non-language test are rather startling.(3)

Such results suggest that the Mexican child in the United States is handicapped when he is tested with a verbal intelligence test. A

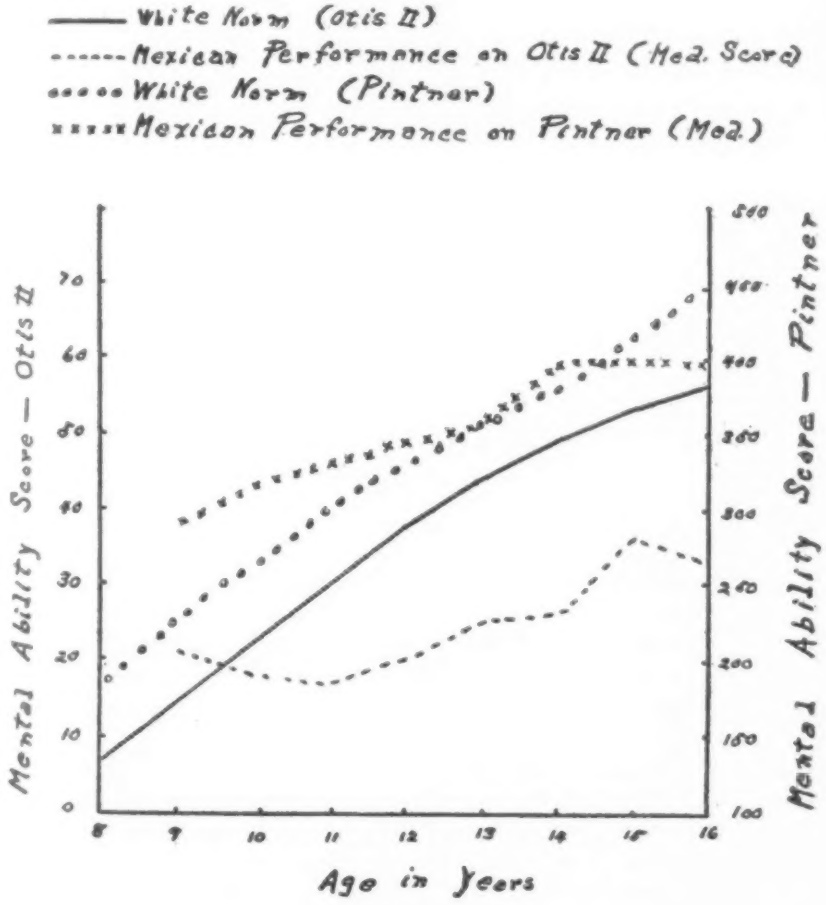

FIGURE 1

CURVE SHOWING RELATION BETWEEN MENTAL ABILITY SCORES (OTIS II AND PINTNER) AND AGE

reference to Tables III and IV will give various correlations to be found between the factors involved in this investigation. It will be seen that verbal intelligence and achievement are closely correlated, since they have a raw correlation of .72 and a net correlation of .54. As to the correlation between the results of the verbal and non-language test, the raw correlation is only .44,(3) but the net correlation is only .14. It is interesting to note that school place-

TABLE III

SHOWING INTERCORRELATIONS OF THE FOLLOWING FIVE VARIABLES

(1) Otis Int. Score, (2) Otis Achiev. Score, (3) School Grade, (4) Pintner Non-Language Score, (5) Age.

Raw Correlations

	(1)	(2)	(3)	(4)	(5)
(1)		.72	.58	.44	.31
P.E.		(.02)	(.02)	(.02)	(.03)
(2)			.66	.45	.34
P.E.			(.02)	(.03)	(.03)
(3)				.51	.64
P.E.				(.02)	(.02)
(4)					.34
P.E.					(.03)

Net Correlations

	(1)	(2)	(3)	(4)	(5)
(1)		.54	.14	.14	—.03
P.E.		(.02)	(.03)	(.03)	(.03)
(2)			.38	.08	—.12
P.E.			(.03)	(.03)	(.03)
(3)				.21	.57
P.E.				(.03)	(.02)
(4)					.05
P.E.					(.03)

ment and age are closely related if we take the raw or net correlation, *i.e.*, .68 or .57.

Table IV gives two groups of correlations: Group A, in which is shown the influence of the three independent variables, achievement, school placement, and age on the dependent variable, verbal intelligence score, and Group B, in which the independent variables are the same as in A, but the dependent variable is the non-language intelligence test score. Regression equations are also given.

In the case of Group A the multiple correlation is .73, but if we control age it is .71. In the first case the relative weights to be assigned to achievement, school placement, and age are 31, 10, and –1. By the multiple correlations of .73 and .71 verbal test results are seen to be highly influenced by the educational factors,

but little by age. When we control age, the relative weights between achievement and school grade are respectively 36 and 10. In Group B, when the dependent variable is the non-language test score, the multiple correlation is only .54 and the relative weights

TABLE IV

SHOWING PARTIAL AND MULTIPLE CORRELATIONS OF TWO GROUPS OF VARIABLES, A AND B

Group A

(1) Otis Int. Score, (2) Otis Ach. score, (3) School Grade, (4) Age.

$r_{12}=.72$ $r_{13}=.58$ $r_{14}=.31$ $r_{23}=.66$ $r_{24}=.34$ $r_{34}=.64$

$r_{12.34}=.55$ $r_{13.24}=.18$ $r_{14.23}=-.03$

$R_{1(234)}=.73$
P.E.$=.02$

Regression Equation:
$X_1=b_{12.34}x_2+b_{13.24}x_3+b_{14.23}x_4+K$
Special, $X_1=.61x_2+.20x_3+.20x_4+K$

Relative weights:
Achievement Score$=31$, School Grade$=10$, Age$=-1$.

$R_{1(23)}=.71$ (Age eliminated)
P.E.$=.01$

Relative weights, age eliminated:
Achievement Score$=3.6$ School Grade$=1$.

Group B

(1) Pint. Non-Lang. Score, (2) Otis Ach. Score,
(3) School Grade, (4) Age.

$r_{12}=.45$ $r_{13}=.51$ $r_{14}=.34$ $r_{23}=.66$ $r_{24}=.34$ $r_{34}=.64$

$r_{12.34}=.18$ $r_{13.24}=.20$ $r_{14.23}=.12$

$R_{1(234)}=.54$
P.E.$=.03$

Regression Equation:
$X=b_{12.34}x_2+b_{13.24}x_3+b_{14.23}x_4+K$
Special, $X_1=.21x_2+.29x_3+.14x_4+K$

Relative weights:
Achievement Score$=1.5$, School Grade$=2$, Age$=1$.

$R_{1(23)}=.44$ (age elminated)
P.E.$=.04$

Relative weights, age eliminated:
Achievement Score$=1$, School Grade$=1\frac{1}{4}$.

of achievement, school grade, and age are respectively 15, 20, and 10. If we control age, the multiple correlation is reduced to .44, which shows that here age is a significant factor as influencing the non-language performance. The relative weights of achievement and school grade are then 10 and 12.5. These last comparisons

show that beyond a doubt educational factors influence the non-language test results much less than they do verbal test results.(4) The correlation of .44 between these two variables, ability in non-language and verbal scores, shows that while they are mutually dependent, they, on the whole, lack much of being identical abilities.

SUMMARY

1. Age for age and grade for grade, the Mexican children are inferior to American whites in verbal test results.
2. But in the non-language test results the Mexicans are practically equal in performance to the American whites.
3. I.Q.'s derived from the non-language tests are on the whole about equal to the American white I.Q., though the verbal test I.Q. is, for the total group of Mexicans, 79.5. This last figure has often before been obtained for Mexicans.
4. This study points to the possibility that verbal tests are unfair to Mexican children if we grant that both tests really test intelligence.

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DREAMS IN WHICH THE DREAMER KNOWS HE IS ASLEEP *

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"ZU den interessantesten Punkten der Traumpsychologie", writes Dr. J. M. Vold, "müssen die zum Teil recht komischen Träume gerechnet werden in denen der Versuch gemacht wird zu entscheiden, ob man wach ist oder träumt".†

But in spite of their great interest few writers have done justice to such dreams, most often assigning them to the moment of waking, or to hypnagogic or reverie states. This neglect is doubtless due to the rarity of the phenomenon in the experience of all but a few observers. I myself have almost a hundred instances in my personal record; the late Dr. van Eeden had over three hundred, but F. W. H. Myers, who was as deeply interested as any one, experienced but three examples in ten years. The one he gives, hidden away as it is in an article on psychical research, may here be profitably quoted as an unexcelled introduction to the subject. Myers writes,†

"I have long thought that we are too indolent in regard to our dreams; that we neglect precious occasions for experiment for want of a little resolute direction of the will. . . . I mean . . . that we ought to accustom ourselves to look on each dream not only as a psychological *observation* but as an observation which may be transformed into an *experiment*. . . .

"I was, I thought, standing in my study; but I observed that the furniture had not its usual distinctness—that everything was blurred and somehow evaded a direct gaze. It struck me that this must be because I was *dreaming*. This was a great delight to me as giving the opportunity of experimentation. I made a strong effort to keep calm, knowing the risk of waking. I wanted most of all to see and speak to somebody, to see whether they were like the real persons and how they behaved. I remembered that my wife and children were away at the time (which was true), and I did not reason to the effect that they might be present in a dream though absent from home in reality. I therefore wished to see one of the servants; but I was afraid to ring the bell, lest the shock should wake me. I very cautiously walked downstairs—after calculating

* Received and acknowledged July 31, 1934.
† See appended bibliography.

that I should be more sure to find someone in pantry or kitchen than in a workroom, where I first thought of going. As I walked downstairs I looked carefully at the stair carpet, to see whether I could visualize better in dreams than in waking life. I found that this was *not* so; the dream-carpet was not like what I knew it in truth to be; rather, it was a thin, ragged carpet, apparently vaguely generalized from memories of seaside lodgings. I reached the pantry door, and here again I had to stop and calm myself. The door opened and a servant appeared,—quite unlike any of my own. This is all I can say, for the excitement of perceiving that I had created a new personage woke me with a shock."

Myers thus shows an uncommon appreciation of the true importance of the state as making possible the formation of psychological judgments on the dream while dreaming. In fact, as I have found, it brings under observation even the transitions between dream-scenes. These transitions, normally unconscious, naturally seem like the process of waking up when first experienced by the critical conscious function. I venture to suggest that if Myers in his dream had rung the bell, as he feared to do, though seeming to himself to be waking up he would actually have witnessed simply the fading out of one dream-scene and its replacement by another: he might have dreamed of waking in some seaside lodging, where the same strange servant might have looked in and asked, "Did you ring, sir?"

I myself have sometimes striven to wake up from a dream of this sort and have at first secured only such a *false awakening*.* The feeling of being on the verge of waking up must therefore be regarded as altogether illusory. The assignment of this type of dream to the last moments of sleep is thus a natural but none the less serious mistake. Dr. van Eeden testified that his "lucid dreams" normally gave place not only to a false awakening but to further dream-episodes of the "non-lucid" type before he really woke up. The term "lucid" he applied to such dreams as involved not only the recognition that he was asleep but a more or less complete memory of his current waking concerns as well. It should be clear, in the example quoted, that Myers did not merely "dream that he dreamed", or "dream that he remembered his family's absence", as if there were really some mistake about it. Nor may the state be dismissed with any other merely verbal tag such as "volition", "l'attention", or "Selbstbewusstsein".

Another error lies in the confusion of this dream-state with

* On false awakening, see H. A. Carr in Psychological Review, 1912, xix, 62. Helen Keller also observes, "there is no difference between the consciousness of the sham waking and that of the real one."—"My Dreams", Century Magazine, 1908, lxxvii, 71.

that of "hypnagogic imagination".† The dreams that I am describing, as I have meant to make clear in the title, are genuine sleep-dreams. In hypnagogic visions the subject is not asleep but awake, fully aware of his real bodily position and therefore incapable of taking an active part in the visionary scene, of which he remains a mere spectator. Such visions also are very clear, in contrast to the unclearness noted by Myers in his dream-environment. Even the critical faculty exercisable in both cases is not the same. In the "lucid dream" it is chiefly concerned with the implications of the fact that it *is* a dream. In the visions its sole concern is with the imagery. Thus the dream cannot be simply a hypnagogic vision, though it may contain examples of this or any other mental process, as in the first dream quoted below, which presented a quasi-hypnagogic picture-show just as it was becoming "lucid" (if I may adopt Dr. van Eeden's word), *i.e.*, just as my dream-consciousness was becoming critical enough to raise the question, "Is this a dream?" But the passive gazing ceased and dream-activities were resumed on an increasingly lucid basis.

For the rest, I shall devote all my evidence to combating the fallacy that dream-lucidity is allied to daydreaming. Sante de Sanctis, for instance, treating of dream-volition, writes in Kafka's *Handbuch*, "Ein klassisches Beispiel dafür ist der Fall, dass man im Schlafe sagt: es ist ein Traum, ich will fortfahren zu träumen. Dies kommt nach meinen Beobachtungen immer knapp vor dem Erwachen (im leichtesten Schlafe), besonders im Tagesschlafe vor, der eine sehr grosse Ähnlichkeit mit der *rêverie* hat." The inaccuracy of this observation can best be shown by quoting several lucid dreams from my own record, where *reverie in sleep* often occurs in juxtaposition with *genuine dream-hallucination* recognized as such while dreaming. I have carefully written down these dreams on waking, numbering them for reference, and dating them as of that morning, they being characteristically morning dreams. I transcribe them without change except for the omission of some episodes for the sake of brevity, and the insertion of comments in parentheses.

79. June 20, 1934. After several ordinary dream-episodes involving my brother and his friends, I stand looking into a show-room. A velvet-covered exhibition-frame first contains some beer-steins; then, when I look again (unconscious transition), some neckties. Again, it has vanished and the counters are covered with bouquets of very colorful flowers. "Some

† On hypnagogic phenomena, see F. E. Leaning, "An Introductory Study of Hypnagogic Phenomena". Proc. S. P. R., 1925, xxxv, 289–409, with 5 pp. bibliography.

writers", I observe, "would call this a hypnagogic vision: the imagery is so eidetically distinct and scrutinizable. But it is not properly hypnagogic". The flowers fade and vanish (conscious transition), but, to my satisfaction, there appears—like one cinema-scene fading into another—a sparser display of equally brilliant flowers. We are called to the street window behind us. "What will I see out of the window?" I wonder, vaguely aware that I am dreaming, and fearing that it may wake me to look out. . . . I jump up into the air to make sure that I am dreaming (my standard test lately, and an infallible one, superseding the "right comical" tests such as Professor Vold describes). The first jump is light and feathery, but I do not go very high. . . . I am now fully aware that it must be a dream. "This is a lucid dream", I announce to my brother with great elation, thinking: "How strange and gratifying that another such dream has come so soon." (No. 78 was just two days before.) My brother, however, has disappeared: well, I can manage my dream alone. I consider what to do. I remember that I have planned to "call" (as Dr. van Eeden "called" images of deceased friends) a taxi, and to have a lucid dream to be named "Going Places". "Taxi"! I shout; "taxi"! I meet a hotel employé and ask, "Where do I get a taxi?" "Downstairs at the desk", he says, and thither I immediately descend by a short stairway. "Taxi"? I say to a uniformed young man who rises and leads me out to where a sport roadster is parked. . . . He starts the car and turns onto a broad suburban avenue which I at first take to be "Twelfth Avenue by the Hudson River". I consider asking to be taken to some theatre, but do not remember the name of any. It occurs to me that I need not talk to the driver, as he is not a real separate personality. "I suppose you know where I am to go", I say, and he nods affirmatively. It is more than *I* know, and I hope he will not take me to some undesirable dive. I bring a handful of coins out of my pocket, hoping that my dream-money will appear in convenient denominations. I turn my thoughts to the earlier stages of the dream to fix them in my mind; but it is a fatal mistake. Attempting to return to the taxi-scene, I find it wholly vanished. I can reconstruct it imaginatively, but in such *dream-daydreaming* I do not get anywhere. It does not take hold, and so I resign myself to waking up. But I was far from being awake: what followed was but a false awakening, in which I gather up my handful of coins from among the bedclothes in a baseball grandstand. Then I really wake up. I go over details of the dream for fifteen minutes and spend forty minutes recording it.

Note that I was able in my sleep to try to continue my dream by daydreaming, giving up the attempt, however, when I found that the unconscious spontaneity would not take it over. The first was not a successful continuation of the genuine dream-experience, nor was the other an awakening. Accordingly the supposition that lucid dreams are but daydreams, or that dreaming in

general is "imagination during sleep", must be abandoned. My original waking plan to conduct a lucid dream by calling a taxi was something of a daydream. But of such idle phantasies I make no record. The actual dream recorded above is more interesting in its abortiveness than was the anticipative daydream in its completeness. Reverie in sleep, it should be observed, occurs naturally in a lucid dream, being carried on by that special consciousness which longest survives the general blotting out incident to the shifting of dream-scenery. But far from being identical with lucid dreaming, this interlude of dream-daydreaming shows itself clearly as a separate and inferior phenomenon.

To mention specific differences, the reverie, whether in sleep or in waking, is never critical of itself: it does not invite tests nor afford an opportunity for experimentation. The judgment "I am daydreaming" is never a surprise but always an error, for the daydream has *ipso facto* been suspended when criticism supervenes. The genuine dream, however, whether lucid or non-lucid, is primarily the work of an unconscious shifter of scenery, who may be confronted by the critical consciousness, sometimes setting up for the latter an experiment in which both coöperate, sometimes opposing the conscious function, offering it the mockery of a false awakening in fraudulent exchange for its hard-won lucidity. The daydream, furthermore, once it gets under way, is largely an affair of the emotions, imagery being sketchy, understood rather than actually presented for inspection as in dreams proper. Excerpts from a few other examples will show how lucid dreaming contrasts with daydreaming, especially when the two alternate with each other in sleep.

60a. Dec. 2, 1933. After several vivid but non-lucid dream-scenes ending near a cabin on a cliff, I am amazed to conceive that I may be dreaming. . . . I jump up into the air and by the slowness with which I come down I am convinced that it really is a dream. . . . Running down the slope towards the precipice, I take off my coat and jump into the air to try to fly. I find that by turning almost head-downward I can stay in the air, and by waving my coat about near the ground I can progress horizontally. I come to the edge of the precipice and wish to fly out over the lake; but I feel the spontaneity leaving the dream. I think, "This is getting to be but little better than a very absorbing daydream." I continued to float out over the abyss, but the experience became so artificial as to hold no further interest. I was not quite awake (that is, not in possession of my sensorimotor functions) but felt that I could be so by an effortless redirection of attention, which proved (in this rather exceptional instance) to be the case. It was 5:00 A.M. and I wrote till 5:30.

60b. (Later the same morning.) After dreaming of a journey to a place supposed to be home, and of worrying about my money and baggage on setting out to return, I find myself walking across a bridge. The thought occurs that it would be interesting if this could be a dream, though it seems scarcely possible that such a realistic experience could be unreal. I jump up into the air as usual. The first test seems inconclusive, but on the next attempt it takes several seconds to come down. . . . I have long wished to draw a picture and make it real, thus gaining control of the dream-environment. I fumble in the pocket of my overcoat hunting for drawing materials, but I find none. . . . I walk on, noting that the dream-realism is beginning to fail (especially as regards the sense of weight as I walk). Spots of light appear overhead, as if intrusions of actual optical stimulation. I hop up to the bridge-rail, but this act wears the dream (or dream-scene) so thin that an actual dive would have been mere daydreaming—or *dream-daydreaming*, for that which supervened was merely a false awakening. I seem to wake up in my room, lying on my right side; then in a hotel room, my concern about my money and baggage reappearing. . . . I finally wake up and find I am really lying on my back instead of on my right side. It is 7:15. I write till 8:00.

74. April 21, 1934. At a desk by a window I think: "I am asleep." I hold up my hand. "If I wake myself now, will I find that I am sitting at the desk with my hand really in some other position?" I prefer to go on dreaming. "I am near waking, here at this desk", I think, "but if I am careful I may avoid full awakening". I look out of the window and picture myself standing outside on the veranda-roof; *but this piece of dream-daydreaming does not become a dream-reality. I am still at the desk.* I have a book with an index. "I have never in a dream looked up anything with an index. I will try it." Quite realistically I verify an indexed title. I walk about the room. . . . I continue the dream but without lucidity, waking at 7:00 A.M., surprised that I was really sleeping not in a desk chair but in bed.

76. May 7, 1934. (An eleven o'clock supper of mince pie and milk may explain the unpleasantness but not the lucidity of the following. I arose at 6 A.M. remembering to put out a milk bottle, being alone in the house, and then went back to bed.) I see a boy in the kitchen, then a man. How did they get in with all the doors locked? Then with some elation I discern: "It's a dream; now I can experiment." I remember that I have thought, among other things, of trying murder in a lucid dream, and so I attempt to tear the boy limb from limb, but I cannot make the least impression on his body with my hands. The experiment is distasteful and I desist. I pass into an unfamiliar room, a kind of woodshed with a pit seven feet deep in the center. A man sits on the steps that lead into the pit. At first he is our friend the Rev. Mr. ———, but later he is more like a young hobo. I tell him he must be hanged. There is a noose dangling on the opposite side of the pit, and an apparatus

for winding it up. I find myself precariously poised aloft, trying to adjust the rope. I draw down what I judge to be a sufficient length and then descend to the rim of the pit. "You are about to enter the next world", I tell the young man. Again I feel an aversion to continuing the experiment, but reflect that it is certainly a dream, and can do no real harm, while it may be both interesting and informative if carried out. "Perhaps", I think, "if I somewhat let go of the reality of the situation, it will seem more tolerable". *I withdraw all imaginative coöperation from the dreaming function,* at the seeming risk of waking, but am satisfied to observe that I do not wake up, though the objects in the room have a very reassuring dream-like vagueness. "It is certainly possible—indeed now actual—to conduct introspections in a dream", I notice. The young man has obediently come around to be hanged. He jumps down onto a chair that stands on the floor of the pit. "He thinks he is to be lifted from there", I reflect; "evidently he does not understand hanging". I tell him to come back up. I adjust the noose, and, again reassuring myself with the thought that I am obviously acting in a mere dream-world, I lift the boy and plunge him into the pit. I almost expect the shock to tear his head from his body, but it does not even kill him. On the floor of the pit he sits up and raises his hands to his neck, seeming to suffer a great pain. As I stand looking down at him, I wake up. I have been lying on my left side. It is 6:45. I spend an hour writing down the dream.

The above examples illustrate not only the point for which they were selected but several others besides: dream-reasoning, the use of dream-gravity as a criterion, the memory of waking life and of plans for the conduct of lucid dreams. Other dreams than the ones so fragmentarily given might have illuminated these points more interestingly; but when it is a question of the very existence of a phenomenon secondary considerations can wait. The references to Dr. van Eeden, Mrs. Arnold-Forster, and E. H. Rowland, if consulted by the reader, should yield sufficient confirmation of the main point.

I have not succeeded in tracing dream-lucidity to any obvious cause, certainly not to a pathological cause, for observers (Thomas Reid, Dr. van Eeden, and the present writer) testify that these dreams occur only or chiefly in times of perfect health. A sixty-two day cycle has seemed to regulate some of my own dreams,—suggestion, possibly, though a lunar-monthly * chart, previously tried, led to no results at all. And Dr. van Eeden writes, "When I have been flying in my dreams for two or three nights, then I know that a lucid dream is at hand." A dream that can be either

* Cf. J. Nelson, "A Study of Dreams". American Journal of Psychology, 1888, i. 401. He finds a lunar "ecbolic" cycle affecting dreams generally.

predicted by characteristic signs several days in advance, or caused by suggestion at even longer range, cannot be laid entirely to the dietary sins of the evening before, though they may influence its content and even facilitate its appearance.

I do not offer any explanation of the state, but only insist that to experience it is to recognize it as a special mental condition not to be confounded with the reverie state, the hypnagogic state, or any other familiar state unless it be a kind of auto-hypnosis. The hypnotic cultivation of this variety of dream would seem to be a promising experimental project.

The following bibliography contains all the references that I have found directly bearing on the subject, though only the first five items have much to contribute.

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MIGRAINE FROM THE STANDPOINT OF PSYCHODIETETICS *

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WHEN psychological phenomena exhibit some sort of a relationship to diet, then we are dealing with what may be termed psychodietetics. This question has already been discussed (32) and an extensive bibliography has been published (33) so that it need not be given further consideration here. Since migraine has received attention from the dietary standpoint in recent years, this paper will be concerned with a summary and criticism of the literature on this phase of psychodietetics.

The symptom-complex, commonly called migraine, has been known since the time of Hippocrates according to Rupert and Wilson (66), although this does not seem to be accepted by all writers (Bassoe, 13). It is even possible that this malady has afflicted man since primitive time. The existence of ancient trepanned skulls would seem to indicate that desperate methods were at times employed to relieve distressing head conditions. Although this ancient surgical operation could have been performed because of brain tumors or epilepsy, it may very well have been provoked by the severe headaches which often are a prominent feature of migraine. Despite its antiquity, no satisfactory treatment was worked out and man has for centuries been enduring periodic migrainous attacks. However, in recent years there have been developments which would seem to indicate that at least certain cases may be hopefully treated.

The syndrome has been known under various names such as megrim, the megrims, hemicrania, cephalalgia and is now quite generally called migraine. The term hemicrania has been objected to because it does not suggest pain. On the other hand, it has been claimed that pain is not always a symptom but nevertheless the patient will exhibit considerable shock (16, 66). Some writers maintain that since the disturbance is not always on one side of the head the term hemicrania, literally meaning "half head", is really a misnomer. From this it may be judged that there is no constant symptomatology which can be entirely relied upon. A

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list of symptoms mentioned in the literature is of considerable psychological importance. We find languor, loss of appetite, abdominal discomfort, nervousness and irritability, unusually fine feeling the day before an attack, bulimia, druggy or profound sleep on night preceding headache, faintness and vertigo, diplopia, scintillating scotomata, zig-zag lights, flashes of light, colored dazzling spectra, sudden dimming of vision, dizziness, palpitation of the heart, sensitiveness to noise and light, hemianopsia, photophobia, paresthesia of hands, feet and face, motor aphasia, transient ptosis, paresis, mental confusion, nausea, emesis, and movement of head causing agonizing pain (8, 14, 22, 37, 43, 51, 54, 60). The headache is generally, though not always, unilateral (9). Sometimes the pain is localized in or behind one or both of the eyes. Again it may be definitely placed in one of the temples (15). In the more severe cases there may be complete prostration making it necessary for the patient to spend some days in bed. An attack is generally followed by a feeling of exhaustion and there may be polyuria, rhinorrhea and sleepiness. Although Moersch (54) has suggested psychotic disturbances, most of the symptoms are sensory, particularly visual. In fact, Grimes (38) has characterized migraine as "a recurring paroxysmal sensory disturbance". Weber (77) has considered the psychological factor in migraine and Critchley and Ferguson (23) believe that "true attacks of migraine are very frequently encountered in association with mental overwork, anxiety, or suppressed rage and humiliation". It may be that, as Balyeat and Brittain (7) think, the psychological condition is not the cause but merely predisposes toward an attack. If mental conflict can predispose toward or actually precipitate an attack, it certainly would be interesting to know more about the mechanism whereby this is brought about. With such an array of symptoms as has been listed above, it can be appreciated at once that a trained psychologist working in connection with a medical clinic where migrainous patients are treated, would be in a position to make some valuable contributions to our understanding of the psychology of migraine. Up to the present this malady has received no attention, experimentally, on the part of psychologists.

Reliable figures on the prevalence of migraine in the general population are difficult if not almost impossible to obtain. Balyeat and Rinkel (9) consider 7 per cent of all people in the United States a conservative estimate. They also estimate that 2 per cent of all children manifest the symptoms of migraine some time

during the first decade and that a million children under twelve years of age are victims of this disorder (8). Bramwell (16) remarks that "migraine is a common condition" and found that 12 per cent of a class of senior medical students suffered or had suffered attacks of migraine. The frequency with which the term "sick headache" is encountered in everyday speech makes it quite probable that migraine is fairly prevalent. It is interesting to note that this symptom complex according to Balyeat and Brittain (7), is not commonly found among the Negroes, Indians or Chinese. Balyeat and Rinkel (9) state that migraine is to be differentiated from functional headache, tri-facial neuralgia, myalgia, intoxications such as those of alcohol, tobacco and uremia, and from headache due to a brain tumor or pituitary dysfunction.

A large number of cases seem to develop the typical symptoms at an early age (Balyeat and Rinkel, 8). Balyeat and Brittain (7) found that nearly a third of their cases experienced the onset during the first decade. McClure and Huntsinger (50) found that of their 78 patients, 65 (83 per cent) had developed migraine by the age of twenty. Rupert and Wilson (66) state that the "symptoms usually begin in childhood".

The frequency of attacks has been studied by Allan (4) in 566 cases. He found that 53 per cent of the patients experienced a headache once in two weeks or oftener while in 82 per cent of the cases an attack occurred once a month or oftener. It seems quite certain that the frequency varies considerably from one individual to another.

Allan (2) quotes Riley, Edinger and Crookshank as favoring the notion that migraine is more prevalent among cultured, professional, upper-class or brain workers than among the so-called "lower" classes. Although this idea seems to be rather widely held, it is doubted by Auerbach (2), and Allan (2) gives figures comparing 1,000 non-migrainous cases with 400 migrainous from which he concludes that there is no relation to occupation. However, a careful inspection of his table shows that somewhat fewer laborers and somewhat more professional people were affected than would be expected. It is interesting to note that when we apply the statistical method of Chi Square to Allan's own data his conclusion is not supported but just the opposite, namely, that there is a relationship to occupation. Now, it may be that the work of laborers is less interfered with by headaches or that laborers are more reluctant than professional men to go to a

physician because of a headache. If these or similar conditions hold true, then the generalization that professional people and laborers are about equally often afflicted may be true and would be contrary to the generally accepted notion, but it is extremely unlikely that this conclusion is warranted on the basis of Allan's table. Critchley and Ferguson (23) are of the opinion that a relationship to intellectual and artistic personalities has "certainly been overstressed".

It is thought by many that more women than men are affected. Rupert and Wilson (66) consider that women comprise 60 per cent of the patients. This is in disagreement with Allan (3) who thinks the proportions are equal but that women suffer more severely and therefore one sees them, clinically, more frequently (5).

A number of writers are of the opinion that migraine is hereditary (2, 7, 25, 34, 47). Grimes (38) states confidently that "in all instances it is an inherited familial trait. There is no acquired migraine." Allan (3) concludes that his evidence indicates inheritance as a dominant unit mendelian character. A study of 104 cases of migraine has led Ely (28) to declare definitely in favor of heredity. It would seem to be the prevailing opinion that this syndrome makes its appearance under the influence of hereditary conditions and while this may be correct, it is necessary, from the psychological standpoint, to be just a little skeptical. How reliably can a patient report on migraine, or any headache for that matter, in an ancestor or a relative? Histories are often taken in a routine way and sometimes by an assistant or secretary who may be wholly unimpressed with the importance of the procedure and who may be quite unaware of the influence of suggestion. Finally, we are dealing with the old tendency to make inheritance an alibi. People seem to derive a certain amount of comfort from being able to assign their afflictions to some ancestor. Further studies with these criticisms in mind would seem to be desirable.

That migraine occurs in an individual with a neuropathic constitution has been suggested and, according to Allan (2), is held by many authorities. Grimes (38) seems to favor this theory for he writes, "hysterical seizures frequently take the place of migrainous attacks" and "a considerable number of migraine cases belong to the group of defensive psychosis". He conceives of the symptoms as developing out of an "inherent instability of the nervous system". Kennedy (46) suggests that asthma,

urticaria, migraine and epilepsy are paroxysmal attacks occurring in neuropathic stocks while Moersch (54) considers the possibility of a relationship to cyclothymic personalities. Ely (28) compared a group of 104 migrainous subjects and 171 cases of idiopathic epilepsy with 100 normal persons. He found, briefly, that both the migrainous and epileptic patients reported a high percentage of ancestral migraine while neither group reported much ancestral epilepsy. The findings can be criticized on the ground that the average person will much more readily admit a "headache" in the ancestry, particularly if he is looking for a scapegoat, than he will epilepsy or "fits". The social attitude toward epilepsy as something disgraceful would cause it to be reported less frequently than it should be. Other writers, Balyeat and Rinkel (9), Barborka (10), Bramwell (16), Gowers (37), Hubbell (41) and Moloney (55) have denied that there is a relationship between epilepsy and migraine. Allan (2) compared 4,000 consecutive case histories of all kinds with 400 cases of migraine. He found but slight differences in the percentages of epilepsy and psychoses and these in favor of the migrainous group. His conclusion is that epilepsy and psychoses are not associated with migraine. In 1907 Thomas (71) reported that migraine results in an area of softening in the brain which shows itself by a permanent paralysis, aphasia or hemianopsia. These findings do not seem to have been supported by later writers. Hubbell (41) flatly states that migraine does not lead to insanity and Buchanan (21) writes that there is no harmful influence upon longevity.

It is to be expected that a disorder so frequently encountered as migraine should lead to considerable speculation as to its etiology (Bassoe, 13; Riley, 59). Gordon (35) declares "there is scarcely an organ or tissue in the body which has not at some time or other been accused as the cause of the trouble". Although it may be somewhat premature to announce that the etiology of migraine has been definitely established, a very impressive body of literature has accumulated in recent years suggesting an allergic disturbance. Gould (36) and Hurst (44) have declared emphatically in favor of eye-strain but Balyeat and Brittain (7), Bigland (15) and Curtis-Brown (24) suggest that eye-strain may be the immediate provoking condition acting upon an already sensitized nervous system. Stevens (69) and Hartung (40) reject allergy and propose dysfunction of the endocrine glands. The actual attack is considered by many writers (8, 9, 16, 26, 29, 30, 42, 43, 46, 64, 75) to be a vasomotor spasm of the meningeal and

cerebral blood vessels. Such a condition, it is thought, could be induced by hypersensitivity.

It has been the experience of Brown (18, 19, 20), Hartsock (39) and Minot (53) that carbohydrates are primarily at fault, although proteins are not necessarily to be ignored. The ketogenic diet has been found, clinically, to be of some value in treatment by Barborka (10, 11), Pollock and Barborka (56) and Schnabel (67). It is possible that the ketogenic diet derives its value from the fact that carbohydrates are greatly restricted. A number of other writers (6, 7, 8, 9, 14, 17, 24, 25, 26, 29, 31, 34, 39, 45, 46, 47, 49, 50, 52, 53, 55, 56, 57, 60, 62, 63, 67, 68, 70, 72, 73, 74, 75) favor hypersensitivity, some with a great deal of enthusiasm. Rowe (64, 65) thinks that every case of migraine should be investigated with the possibility in mind that a food allergy is responsible for the disorder. Van Leeuwen and Zeydner (48) think they have been able to demonstrate a poison in the blood of allergic individuals. Critchley and Ferguson (23) and Rinkel (61) accept allergy but caution against far-reaching conclusions. It is possible that only certain cases are allergic and therefore only a limited number will respond to food elimination. It may be argued that no allergic headache should be considered a case of migraine. If we consider migraine a symptom-complex rather than a disorder with a single pathology, then there would seem to be no reason why we should not speak of "allergic migraine". Should it prove to be true that an "inherent instability of the nervous system" is the basic fault, then we may entertain the theory that allergy, eye-strain, glandular dysfunction and other conditions merely act as precipitating factors. In that case we might very well speak of "allergic migraine", "ophthalmic migraine", "glandular migraine", and so on.

SUMMARY

Since a number of authors have held in recent years that migraine has a relationship to diet, this malady is to be considered a phase of psychodietetics. It is possible that man has been afflicted by this disorder since prehistoric times. Certain symptoms, primarily sensory disturbances, make it of considerable interest to the psychologist. Although rather common among Europeans, it is supposed to be relatively rare among Negroes, Indians and Chinese. Typical symptoms are developed in most cases at an early age. The frequency of attacks varies considerably from one individual to another. One study shows that about four-fifths of the cases experience an attack once a month

or oftener. It is rather commonly believed that migraine is associated with high mental ability but this question must be considered unsettled at the present time. Whether or not more women than men are affected, as many think, is still an open question. It seems to be almost universally accepted that there is an hereditary factor in migraine. However, a critical attitude toward the usual methods of collecting data on hereditary tendencies leaves us with a strong desire to see further investigations under improved conditions. The theory that migraine is related to epilepsy and that it is frequently found in those with a neuropathic constitution does not seem to be convincing. A great many theories as to etiology have been proposed but the frequency and enthusiasm with which food sensitivity has been mentioned in recent years makes it necessary to consider this suggestion rather seriously. The proponents of this theory maintain that eyestrain, accepted by some writers, is merely superimposed upon an already hypersensitive conditions. The immediate condition is thought to be a vasomotor spasm of the meningeal and cerebral blood vessels. The possibility is suggested that allergy, eyestrain, glandular dysfunction and other conditions may act as precipitating factors in the presence of an "inherent instability of the nervous system". Although the symptomatology of migraine is such as to make it of psychological importance, it has not received an adequate, experimental investigation from the psychological standpoint.

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IS STUTTERING ABNORMAL?*

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IN planning the regimen of treatment for any dysfunction, it is helpful, if not necessary, to know its causation. There are three categories into which the etiological pictures arrange themselves. The misbehaving function may be the result of (a) the development of unusual habit-patterns; (b) the presence of a physical pathology caused by injury, poor diet, unwholesome conditions of sleep, work, or play, disease, or a warping of the organism by restraints of natural and necessary movements and acts; or (c) inherent deviations of the organism from type,—deviations that are, considering each by itself, within normal limits, and yet in their disbalance one with another in the same organism produce the dysfunction in question. Modern thought about stuttering (stammering, spasmophemia) is beginning to take stock of the backgrounds of that dysfunction in order the better to evaluate various proposed methods of treatment. There are those (a) who think of stuttering as a psychoneurotic habit; there are those (b) who regard it as the resultant of various injuries, diseases, or conditions environing the patient that have wrought in the neuromuscular system an actual change in structure rendering smooth speech impossible; and last there are those (c) who declare that the stutterer, though normal, is, so far as his speech equipment is concerned, fundamentally different from the nonstutterer. Then, of course, there are those—and many of them—who maintain that the stutterer is all that is implied in a, b, and c, and that stutterers differ among themselves in the degree to which these various factors are dominant.

Out of the thinking of each group grows a rationale of treatment. The first group (a) would subject the stutterer to mental and emotional hygiene and therapy. The second (b) would devise means of correcting the assumed distortion of the neuromuscular

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system, or of compensating for it. The third group (c) is the group whose philosophy of stuttering I wish principally to discuss, because it is perhaps the newest of the three.

THE PSYCHONEUROTIC THEORY

They who contend that stuttering is an evidence of an inherent condition take the position that there are two groups of humans, both normal, a group with facility of speech and one with clumsiness of speech, and that these groups tend to be greatly overlapping. These workers in the field of speech admit that because of his condition the stutterer readily acquires psychoneurotic traits, but they contend that the basic and initial difference between the stutterer and the non-stutterer is not that of habits or emotional sets. They challenge the believers in the psychoneurotic causation of stuttering to show a single mental picture in the stutterer that is not present in just as large a proportion in the non-stuttering population as among the stutterers. Various attempts have been made to meet this challenge, but no study has been given to the world, showing that the stutterer at the beginning of his dysfunction is either more emotional and neurotic than others of his age and sex, or that his emotional picture is different qualitatively from that of the non-stutterer. The fact that the symptom of stuttering comes and goes apparently with changes in the emotional situation of the patient has lent considerable strength to the position of those who believe in the psychoneurotic causation of stuttering. Their challengers, however, contend: that the emotional factor is but the precipitating condition, which can operate only in the presence of a basic cause bringing the patient almost to the threshold of stuttering and holding him there constantly; that emotional stresses are to the stutterer what the murder of the Archduke was to the World War.

The greatest incidence of stuttering is found in the period from the beginning of speech to about the age of eleven years. It is many times more prevalent among males than among females. It would be difficult to predicate an emotional habit that reaches a peak of prevalence at about the age of ten years and to which boys are peculiarly prone. There is probably no period in life when psychoneurosis is less likely to appear, and, with the possible exception of senility, when there is less psychic difference between the sexes.

THE PATHOLOGIC THEORY

The believers in the "innateness" of stuttering challenge also those who think of this affliction as being pathological in a physical sense. In order to be classifiable as a pathology, a condition must show itself to be rooted in the physical failure of some tissue, or organ, or part to perform its basic functions. A hand that cannot grasp gives presumptive evidence of a definite pathology; but a hand that can grasp but cannot be trained to finger the strings of a violin, shows no real evidence whatever of pathology; for hands were made for grasping, not for violin playing. It just happens that some hands can do both, but the failure of the latter function is by no means as significant of pathology as the failure of the former. We say of a patient who died from apnea that he probably suffered from some physical pathology, but the student of voice, who cannot be taught to speak in breath-groups longer than a few syllables, is by no means to be thought of as having a probable organic pathology; because breathing was intended to sustain life, not to furnish air pressure for vocal utterance of the "Gettysburg Address".

The muscles, nerves, glands, and viscera of the stutterer may be functioning quite normally not only as separate parts of the organism but also as co-functioning parts that in their concerted action subserve the natural and innate processes of human life,—all these conditions may obtain and yet the patient stutters. Let the stutterer be of the type who blocks on the plosive continuants. Examine his tongue, jaw, velum, and pharynx. They are normal; and if not normal, their abnormality is of a sort that is not etiologically connected with the stuttering. Neurologically the patient gives no evidence of abnormality of the V, VII, XI, and XII nerves, which serve the articulatory structures. These organs perform their basic functions of chewing, sucking, swallowing, gagging, smiling, sobbing, sneezing, etc., without the slightest suggestion of impairment. Test the strength of any muscle group involved in the articulation of these sounds and it will be found normal. Examine the efficiency of organs of the body that support these muscles in their activity, such as the heart, lungs, liver, etc., and they will be found normal. Study the functioning of the cerebral cortex with any other test but speech and no abnormality explaining lingual spasms can be proved. One can go even a step

farther: break up the plosive sounds into their basic muscle movements, and test the structure as to whether or not these movements can be made, and it will be found again that there is no indication of pathology. The movements of the sound (k) can be made, but when (k) is a part of a series of events in the attempt at a social adjustment of the patient, the blocking takes place.

A second condition that any theory of pathology must meet is that the hypothesis must adequately explain the incidence of the disorder in the age and sex groups in which it is found. The ratio of stuttering boys and girls above thirty-six months of age varies all the way from 3 to 1 and 8 to 1. It has been estimated that one boy in every four at some time in his development passes through a period of stuttering. If stuttering is to be traced to some pathology, one must show just why such a pathology strikes so often at the male. Unless one takes the position that maleness is in itself a disorder, one has to connect the pathology of stuttering with some weakness to which the neuroglandular system of the male is prone; and then the question arises as to the nature of the neuroglandular system of the female stutterer. Are the girls who stutter masculine in physical type or in erotic appetites? It needs no statistics to answer that question. Every practitioner who sees many cases of stuttering will recall that many of his worst female stutterers are unquestionably feminine in anatomic, physiologic, and psychic make-up.

Another point significant of the nature of stuttering is the stuttering itself; and that is about as good evidence as that John is a sufferer from some neuro- or myopathology because he plays football badly. The failure or inability to perform some inherited act such as swallowing or gagging is significant of pathology; but the failure or inability of the individual to perform some learned act means merely that he cannot perform the act. It tells us nothing about why. I cannot play the piano. I have not tried very hard. I have tried golf, and I cannot play well at all. I am fairly good at tennis. I swim well. To argue that my poor golf and my complete failure at the piano is pathological would be silly. My friend can play the piano beautifully; he is also skillful at the cornet, but he stutters badly. Why should we regard his poor speaking and my poor golf-playing in different lights? They are both learned reactions; they both involve special uses of the sensory and muscular equipment that nature, in laying down the pattern for primitive man, could not have contemplated; they both are influenced adversely by emotional situations,—his speaking is disturbed by the presence of strangers, so is my golf; they both

appear in thousands of humans who can pass every test of physiological efficiency that a life insurance company ever devised. They are essentially the same; and yet they have one difference, *viz.*, that by poor golf does not matter, but his poor speech *does*. Hence we pay no attention to my failure, and pay a great deal of attention to his. But the importance of speech to the human should not prejudice us as to the nature of its failure. The degree to which a dysfunction is thought pathological should not depend upon the importance of the function disturbed, but upon the degree to which the dysfunction is due to a failure of some part to perform its basic and inherited functions.

The function of speech is entirely an overlaid one. It happens that 99 out of 100 adults can employ their sucking, chewing, swallowing, and breathing apparatus for the borrowed uses of speech; it also happens that the 100th person cannot. The wonder is, not that he cannot perform these borrowed uses for which his parts were not intended, but that the other ninety and nine can do it so successfully. He is handicapped not so much by any deficiency of his make-up as by rules of the game of speech that other humans have invented and insist that he play. With other games of skill he may play or not just as he pleases; if he can play a game easily and well, he will like it and practice it often; if he cannot, he will leave it severely alone; but he will not be marked for his inability to play the game. Not so with speech; he must play it whether he is skillful or not. And when, in his self-consciousness about his failures, he becomes spastic and tense, some of us who pity him, say, "What a pity, he got into bad habits of speaking when he was a young child!" Others say, "What a pity, he isn't quite normal!" But, then, some of us say, "What a pity we all take speech so seriously!"

THE GENETIC THEORY

Those who contend that stuttering is the result of an inherent difference from type call attention to another fact of incidence, *viz.*, that it is more prevalent in families with stuttering in the genealogical background. In a careful study of 127 stuttering children recently finished at the University of Wisconsin, it was found that on the average there were for each stutterer 1.16 known cases of stuttering in the family tree, going back two generations; while with cases of non-stuttering children matching the first group child for child as to age, sex, and culture, there were only 0.188 cases of stuttering for each child in the family history.

In assaying the findings as to the possible inheritance of stuttering the following facts should be considered:

(a) At those ages after speech develops at which the physiological differences between the sexes is least, the difference in incidence of stuttering is greatest.

(b) At those ages at which the physiological difference between the sexes is greatest (maturity), the difference in incidence is least.

(c) There is no reason to connect the process of articulation, either directly or indirectly, with any of the known functions of sex. Although the voice is modified at puberty and thereafter has a sexual quality, yet the articulation of the stream of vocal tone is about as non-sexual as any of our reactions.

(d) Stuttering is predominantly an articulatory and hence non-sexual phenomenon.

In view of these facts, therefore, we would guess that the tendency to stutter, if transmitted, is carried in the sex-chromasome, rather than being secondarily dependent upon a weakness or dysfunction of the sexual systems *per se*. Color-blindness and pattern-boldness are interesting analogies of stuttering, being as they are essentially asexual, yet thought to be dependent upon the rôle played by the sex chromosome, and showing a striking tendency to appear more in one sex than in the other. The facts of the incidence of stuttering, therefore, point to its inheritance.

If the stutterer is the recipient of a heritage, what is its nature? There are one or two differences between the stutterer and the non-stutterer—differences that can be determined only statistically because they represent variations from a central tendency within normal limits. It is by no means sure that these variations are connected causally with stuttering; they appear, at least, as conditions correlated with stuttering.

Stutterers fall into "left-handed" groups. Bryngelson reports that over half of his stutterers are left-eyed, while only about one-quarter of the non-stutterers studied were left-eyed; one-tenth, or twice as many as in the general population, are amphi-ocular; six-tenths are ambidextrous (the population shows up only one-twentieth); and four-fifths with mirror-scripts, as over against about 15 per cent found in his university group of non-stutterers.

Again, stutterers have a significantly slower rate, than non-stutterers, for diadochokinetic movements of the facial and lingual muscles. The rate to which adult stutterers can drive their facial and lingual muscles in simple repetitive movements is about 20 per cent short of that to which the non-stutterers can attain.

A third rather interesting difference between stutterers as a

class and non-stutterers, is their serological picture. Certain chemical entities are found in the blood in proportions different from the established ratios. These are: (1) inorganic phosphates, (2) sugar, (3) potassium, (4) protein, and (5) calcium. Of these the first two are found in greater quantities in the stutterer's blood, while the third and fourth are found in lesser quantities. As to the fifth, calcium, though the total amount is higher than normal, that part of the calcium that is capable of diffusion through the membranes of the body is present in normal quantities. High sugar rating of the stutterer's blood may not be in any sense etiological; it may be merely the result of the emotional turmoil in which his frequent blockings of speech involve him. On the other hand, one would expect for so constant an embarrassment as stuttering the body would make compensatory adjustments of the blood sugar production, were the sugar merely the result of social anxiety. Aside from the sugar, however, the amounts of the other four blood components mentioned above all fall within the range of health and safety, though they differ from the accepted averages. Apparently the specific amount of any one of these components is not a matter of any meaning in explaining the stuttering; it is rather the ratio of one component to another that is involved in dysphemia. In the normal blood picture, when the total calcium is increased, the amount of inorganic phosphates is decreased; but with the stutterer the amount of inorganic phosphates increases as the total calcium is increased. On the other hand, in the normal blood picture, when the calcium is increased, the protein is increased; but with the stutterers, when the calcium is increased, the protein tends to decrease. Potassium and inorganic phosphates normally rise and fall together, but they are negatively correlated in stutterers, and again, potassium is negatively correlated with the protein in the blood of normal speakers, and yet in the blood of stutterers the amounts of their components rise and fall together. These findings seem to show that there are significantly different linkings between and among certain elements of the blood in dysphemia as over against those of the non-stutterer. These patients (if they can be labelled so), seem to exhibit a different metabolic mechanism from that of the normal speaker. The difference, though unimportant in conditioning of vital processes is of a fundamental nature and disastrously effects speech. The difference varies in degree from case to case. It seems clear that there lies a borderland in this difference between these two bio-chemical types in which the appearance of the symptom of stuttering depends upon psychic

factors. Persons in this borderland will exhibit no stuttering, if their mental hygiene has been fortunate; others like them will stutter at times, and at other times will speak quite normally. On one side of this borderland are a group of persons of normal bio-chemical type who never stutter; and on the other side are a group whose dysphemia is so marked that they stutter even when reading or speaking to themselves in complete private. It is the behavior of the group in the borderland, whose stuttering appears and disappears with changes in their social medium, that gives rise to the notion that dysphemia is purely a phenomenon of poor mental hygiene. Emotional changes probably serve merely to project the patient for a time into a condition of profound dysphemia by a temporary alteration of his serologic and hence of his metabolic and neurologic picture.

It should not be thought that all stutters exhibit all of these symptoms of constitutional differences from the average. It is as though we had four groups of atypicals: (1) the left handers; (2) those having slow diadochokinesis; (3) those having a low serum protein and certain other related bio-chemical differences, and (4) stutterers. These groups tend to overlap; especially does the stuttering group overlap the others. There is no more reason to assume that the sinistrality causes the stuttering than that the sinistrality causes the low serum protein. Left-handedness, if it effected speech causally, would disturb it as it does handwriting, making it clumsy and awkward, not spasmodic. Slow diadochokinesis, if it affected speech directly, would cause stuttering to appear more frequently in girls than in boys, for the average rate for females is slower than for males. It is possible that the bio-chemistry of the stutterers is the basic cause of the sinistrality and of the stuttering both. No one has been able to establish more than merely hypothetical relations between and among these groups. These atypicals seem merely "birds of a feather".

In summary, then, we would describe dysphemia as a condition of the physiologic organism in which the muscular system, though in no way disturbed in the basic functions, yet is disabled in the acquired functions of speech. We are dealing not with a definitely unnatural phenomenon; in fact it may be that stuttering is a definitely natural reaction. It may be, rather, that speech itself is an unnatural function, at least, for a considerable group of humans, mostly males, whose condition may be described not as pathological, but as dysphemic.

One of the factors complicating the production of speech and doubtless facilitating the appearance of the symptom of stuttering

is the bodily mechanism for reacting to situations that arouse the emotion of fear. In a very large sense, the human represents an animal type imperfectly and incompletely evolved to meet its changed environment. Human intelligence has proceeded farther in the modification of our environment, than nature has gone in the evolution of our physical and bio-chemical machinery. There is no reason to suppose that modern man is basically different from his barbarian ancestor. The savage had inherited from a lower form—some primate—an automatic device that cared for his safety in threatening emergencies. His automatic life-saving reactions are achieved through the mediation of the nervous and glandular systems. Every one of these reactions seems to presuppose that the emergency to be provided for is one that calls for violent muscular activity—"fight or flight".

That is the picture of the savage's machinery for meeting a situation; and that also is the machinery of modern man. The only difference lies in the sort of response that the two men find appropriate. The situation in which the savage finds himself is one in which violent activity of the grosser musculature is appropriate; but the situation in which the modern man is often caught in his social adventures is one in which relaxation of the grosser musculature of the body is absolutely required. The savage has machinery fitted to his needs, the modern man has machinery fitted to his needs, only when the emergency is one in which he can act like a savage. When the emergency is one in which he must say calmly and quietly, "Ah, Mrs. Jones, I am delighted to meet you; may I present my sister, Miss Smith," the machinery that he inherited from the savages not only does not help him, but actually stands in his way.

Many persons, when they are flustered in embarrassment, are unable to write smoothly, play a musical instrument, or hold a cup of coffee. It is even more difficult to control the articulatory musculature in such a situation than it is to control the muscles of the arm and hand; for the reason that the musculature of the face, mouth, and throat are, more directly than that of the arm and hand, under the control of the centers of the nervous system that subtend emotional responses of the motor system, probably the thalamus and striate bodies. Thus, wherever the speech situation has an emotional coloration there arises a conflict for the control of the lower motor neurone to the articulatory musculature. Those muscles often, therefore, come under the dominance first of the emotional centers and then of the cerebral

motor cortex. If this shift is rapid enough a decided tremor of the articulatory muscles results. Such a tremor, symptomatic of an emotional state, appears frequently in dysphemia just before the spasms of stuttering occur. Thus, since speech is so largely emotional, the dysphemic person frequently is blocked. It so happens, therefore, that the very part of his musculature that is most difficult for him to control under emotional conditions is the part that social conventions require him to use for his communication. Dysphemia would be less disastrous if man talked with his hands.

SECONDARY DYSPHEMIA

A second factor complicating the problem of stuttering is the reaction of the patient himself toward his own stuttering. Thus far in our discussion we have mentioned the factors that produce the phenomena of stuttering as effects of primary causes; but there is a definitely reflexive and secondary effect of the stuttering that serves to aggravate and accentuate the symptoms. The occurrence of the spasm of stuttering causes the patient greater social anxiety than he would otherwise experience, this, in turn, makes the speech less efficient; and as soon as he becomes oppressed by the potency of this vicious cycle, a definite psychoneurosis develops. This is spoken of as the secondary phase of stuttering. With many adults it is doubtless the larger aspect of the problem; but with children, the secondary phase may be almost wholly lacking. It is only the secondary phase that may be classed as definitely pathological, and here the pathology is psychogenic rather than neurogenic, is functional rather than organic.

THERAPY

No matter what therapy is employed, be it suggestion, hypnotism, phonetic drills, etc., in its administration nothing should be said or done that gives the patient the notion that there is anything seriously wrong with him or that those who are working with him are sorry for him or anxious about him. The attitude of the clinician should be wholly that of the trainer who is preparing an athlete for a difficult contest. Just as a baseball coach would take great pains to correct the faults of technique of the very ordinary batting of his star pitcher, so the clinician must prepare the stutterer to meet his speech situations.

Everything possible should be done to prevent the child from becoming morbid about his failure of speech. With young chil-

dren no attention sho ld be called to the stuttering; with older persons, no nagging should be employed. Every therapeutic measure that is undertaken should be so administered that the secondary phase of the stuttering will be avoided and psychoneurosis forestalled. With stuttering improper treatment can easily aggravate the condition that it is intended to alleviate. These remarks are particularly pertinent to the use of psychoanalysis. There is no one quite so morbid and introspective as he who believes that his normal reactions are evidence of psychic traumata.

PROGNOSIS

The adult patient, having developed the psychoneurotic aspect of his dysphemia, has two chances out of three against him that he will ever be rid of his stuttering. The boy of three years, on the other hand, who is properly handled so as to prevent his becoming anxious about his condition, has equal chances in his favor. It is the degree of the involvement of the secondary or psychoneurotic element in the case that determines the prognosis. No child can come up through his development, stuttering every day of every year, without becoming more or less psychoneurotic about his condition. Hence the prognosis becomes more unfavorable as the child matures. The prognosis is a great deal better with girls than with boys.

A PERIODIC TABLE OF EMOTIONAL PHASES *

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THE desirability of a natural classification of accumulated research data and theories is clear at all times, but especially this year in the progress of science, when the learned world is celebrating the centenary of the birth of Dmitri Mendeleeff, that peerless scientific prophet who in March, 1869, published his immortal paper generalizing "On the Relation of the Properties to the Atomic Weights of the Elements". It is with a sense of respectful imitation that this essay at a classification of certain psychological facts, is offered as a small tribute to the memory of the heroic scientist whose intellectual beneficence we all enjoy.

An attempt is here made to devise a table to make possible the following generalization for a natural classification of emotional behavior; the emotional behavior of an organism is a phase function of (1) the relative superiority of the organism, (2) the relative favorableness of the stimulus, (3) the relative space conditions between the organism and the stimulus.

Emotion is initially defined as, motivated motor behavior (with visceral reinforcement) of an animal in regard to a sensory stimulus. This behavior is understood to be a response more complex than a reflex or a series of reflexes, but rather as a prevailing consistency of reaction to definite stimulation in a problem situation, such as the response unit of Thorndike (45), the behavior item of Gesell (19), the reaction unit of Bühler (8), the act of Carr (11), the action of Bentley (4), and the back action upon the stimulus of Tolman (47). In this sense emotion signifies; the reactional change which the challenging stimulus or problem situation produces on a resting animal.

A psychological period is taken to signify a temporal, spatial or behavorial interval between rhythmic life phenomena at certain points of observation. In this sense Richter (35) discovered a two-hour period between peaks of greatest activity in the white rat. Similarly a four-day activity period was noted by Wang (49) in the gross activity of the female white rat. For the purpose of

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this paper, period is taken to mean; the series of responses between stimulation of the organism and depletion of the stimulated response. In other words, a behavorial interval is said to be periodic which occurs between the original appearance of the problem situation for the organism and the ultimate problem solution, involving the transition of the animal from a state of rest, through states of more or less excited behavior to a condition of rest once more.

Phase is understood to mean, the appearance of a particular activity or behavior state between the limits of a psychological period. Thus the activity of a white rat in a feeding situation might be divided into behavior states of resting, waking, washing, running, exploring, feeding, washing and resting once more. In this sense phase is taken to signify any distinctive behavior pattern in which an animal is detected at a given instance of time and place in reference to a standard position or assumed instant of starting. In this paper the assumed instant of starting is the pre-stimulation resting state. The period defined above will be divided into four phases, and the changing situation into four reacting zones.

Accordingly, for the purpose of this classification of emotions, the life of an animal is considered to be made up of a series of more or less dramatic periods, in which the animal is observed to pass through various environmental zones and concomitantly respond in various behavior phases, from the initial condition of rest through more or less intense activity to rest once more, having more or less agreeable experiences, and attaining more or less successful individual or racial maintenance. Briefly, an emotion is, that particular behavior phase within a particular environmental zone of a problem period, in which an animal appears or advances to, in reference to an assumed starting point.

Approaching the task of generalizing, it is now necessary to determine a basis for the selection of pertinent material from a mass of psychological data and discussions available. At this point of the problem it may be useful to recall the words of Woodworth (51): "Unable to separate the emotions in the intraorganic terms, we needs must seek a basis of distinction in the external situation." This essay will strive, therefore, to construct a classification table on the basis of differential external behavior to external stimuli by organisms, themselves extended in space, admitting of course, the importance of internal activities for bringing about readiness, kinetic reinforcement and internal sensibility.

Passing over the consideration of single emotional behaviors or measured continua as isolated by various workers, it appears more profitable to consider pairs of opposed phases or basic groupings of emotional reactions as recorded in the contributions of present-day psychologists.

Among such recorded observations we have the positive and negative reactions of microörganisms noted by Jennings (25), and the adient and abient responses of Holt (23). There are also the analogous activities of infants as noted by Bühler (8) and Sherman and Sherman (37), and in the case of preschool children by Schramm (36). Paired conditions of joy and sorrow have been noted by Dearborn (15), of desire and repugnance by Dunlap (16), of pleasantness and unpleasantness by Stratton (42), attack and avoidance by Woodworth (51). Quantitative measurements have been made of dislike and like by Furfey (17) and Sullivan (43), of delight and distress by Bridges (6), of yielding and compromise in conflicts by Goodenough (20), of aggression and yielding by Dawe (14), of pugnacity and friendliness by Richardson (34), of stimulated variability and normal rest by Gaskill (18), and of utmost importance, of mild and emergency activity by Cannon (10).

Further steps in a natural classification have been made by Bühler (8) and the Shermans (37) in noting that intended behavior does not always coincide with direction of motion in attack and retreat. Schramm (36) noted that a reversal of approaching movements in stimuli animals may elicit a reversal of emotional reaction in some preschool children. Beaver (3) has divided the social contact behaviors of preschool children into reactions of initiation, acceptance, refusal and non-response. Cannon (10) differentiated the cranial, sympathetic and sacral nerve divisions as bases for differential behaviors. A double pair of complementary behavior patterns has been suggested by Marston (30) in the terms of dominance, submission, inducement and compliance. Bentley (4) proposes "functions in course" of action, which are seizure, attempted resolution, and decline or decay, as modified by dramatic situation and eight varieties of outcome. Goodenough (21) adduces the following dimensions of motivation; intensity of force of stimulus, clearness of ideas what to do, nearness or remoteness (in time) of stimulus situation, and finally with less certainty, polarity or a state of discomfort.

From even a superficial consideration of these findings it is very clear that the old behavioristic S – R equation as such is hopelessly inadequate to balance the factors of emotional behavior, for the reaction depends not only upon the stimulus but equally

upon the quality and condition of the organism, and often in addition upon a present obstruction. More than that, the reaction depends upon a varying favorableness of the stimulus as limited by time and distance, and on the organism as limited by maturity and rhythmic readiness.

It is therefore necessary to postulate at least three principles, dimensions or factors as the basis for a natural classification of the empirical facts introduced above and further adduced below. These factors are: (1) the relative superiority of the reacting organism to the situational problem, (2) the relative favorableness of the stimulus to the organism, (3) the relative time, space and obstruction conditions between the stimulus and the organism.

Theoretically the influence of the first and second factors in the production (and consequently in the classification) of emotions will be readily assented to by the reader. The first factor is clearly important by reason of the extensive findings in genetic, developmental and comparative studies of behavior. The factor of relative favorableness of the stimulus has long been considered in biological studies of maintenance and survival as important.

The theoretical importance of the space factor must also be admitted by reason of the fact that both stimulus and organism are found distributed in space at varying intervals, making stimulation on the one hand and contact on the other more or less impossible or laborious. Furthermore, the organisms and stimulus objects themselves have spatial extensions and do not react with equal intensity with all parts simultaneously. Thus the organism may be divided into several distinct partial reaction systems on an anatomical basis, each part of which has a particular function in the business of maintenance, and in the different zones of a problem period. Accordingly, for the sake of being specific, one might distinguish: (a) the distant receptors and distant fixation functions of the organism by which it becomes aware of far off stimuli, (b) locomotor appendages designed for movements around, over, under or through resistant media, (c) prehensile and extensile appendages for capturing and preserving prey, and defense weapons for subduing and destroying enemies, (d) intimate contact receptor system and functions of deep sensibility for the purposes of nutrition and reproduction.

Consequently, the spatial relations of the organism to the stimulus must be differentiated on the basis of four anatomical divisions of the reacting organism. Furthermore, since each of these becomes operative at different points in the area of a dramatic situation or spatial problem period as measured by their

normal range, extensibility, or projection, therefore, there must be distinguished four critical loci or zones in the time and space extension of a behavior period, in each of which differential behavior appears depending upon which of the four anatomical systems comes to an active phase. These critical points, loci or zones are: (1) the point of orientation or distant fixation of organism on stimulus object, (2) the point of obstruction or place where space, barriers, interference and resistant media are surmounted by locomotor activities, (3) the point of external contact by appendages on goal object, which elicits grasping and combat reactions, and (4) the point of intimate contact or possession consisting in intimate fixation of internal receptors of deep sensibility followed by solution of the maintenance problem and decline of the stimulated drive.

From an empirical point of view, the three factors of superiority, favorableness and space relations must be admitted to be real and actual factors for the production (and consequently for the natural classification) of various emotional states, if these factors have been observed, measured and reported by competent present-day psychologists as active factors in the production of differential emotional behaviors. This we will attempt to show by a citation of experimental evidences, first for the spatial factor and the four critical loci, next for the factor of favorableness and finally for the factor of superiority.

As experimental evidence for the point of orientation as distinct from obstruction, conflict and possession there is the work of Dashiell (13) on the directional orientation of the white rat. There is the study of Hunter (24) also, on the retention of distant fixation to discontinued stimuli, with differential scores for various animals. Working with infants Gesell (19) obtained different age levels for "regard" and for "reaching" for the dangling ring test. The orientation capacity of monkeys has been measured by Tinklepaugh (46). Orientations of older children for "things to do, things to have, things to see" have been scaled by Furfey (17) and Sullivan (43). Visceral reinforcements have been noted in adults in regard to temporally distant stimuli by Landis (29) and Skaags (38) as anticipation.

Experimental evidence for the influence of obstruction upon emotional behavior was first obtained by Moss (31) who concluded that the behavior of an animal is the resultant of its drive and the opposing resistance. Kuo (28) using a maze apparatus combining obstructions of electric shock, temporal blocking and long pathway, obtained a differential order of elimination for each

obstruction. Tsai (48) using multiple obstructions of a kind having graduated difficulty found that the white rat attained the stimulus object according to a "law of minimum effort". The strength of various motivations in the white rat have been measured by several investigators using the Columbia obstruction apparatus devised by Jenkins, Warner and Warden (26). Using this same apparatus Holden (22) observed distinct emergency behavior in white rats under conditions of increasing starvation and increasing electric shock.

The critical influence of the factor of contact with prehensile and proximate presence is likewise supported by experimental evidence. In a study of lizard-eating spiders, Battacharya (2) observed a differential external contact behavior in the spider, during which the latter throws flossy streams of web about the victim to restrain and retain it, before stinging it and consuming it two hours later. Cannon (9) measuring the heart beats of cats, found more intense excitement in the contact struggle of the cat in the experimenter's hands than on exposure to a barking dog not gaining contact. Schramm (36) presented animal pets to preschool children standing at a distance of five feet and noted they made no petting or picking-up motions until they had come alongside within easy reaching distance. When he moved small animals toward seated children, a distinct emotional reversal was noted when an animal agreeable at arms length or beyond was thrust within the child's reaching radius. In such cases proximity caused distinct distress reactions. Dawe (14) in a study of children's quarrels found that more quarrels occur indoors, which favors external body contacts, than outdoors.

Internal contact or possession is also a critical emotional point, according to experimental evidence. The quiescent behavior of white rats after feeding was observed by Richter (35) who found that the general effect of introduction of food was to lengthen the interval of quiescence from one to two hours. It has been recorded by Slonaker (40) that copulation and pregnancy effected the elimination of the oestrus activity cycle in the female rat. Stone (41) by the use of sensory controls excluded the mediation of distant receptors and gustation in the sexual responses of white rats, which were performed nevertheless by inexperienced animals. He concludes the act must depend upon skin and deep sensibility receptors. Young (52) noted the loss of motivation in white rats on attaining possession of the reward food, in the decrement of running activity between alternating food exposures as the animals passed from a condition of hunger

to satiety. Similarly according to Symanski (44) rats after satiation make more errors when running a maze, although they have just previously made perfect scores when hungry. A resting adjustment to possession by an overwhelmingly unpleasant stimulus in the case of cats is recorded by Cannon (9); after a few seconds of struggle the cats became passive when being fastened to boards. Skeel (39) found something similar in passive behavior of children, who having made failures on the difficult end of a series of formboards, became disinclined to perform on the easier formboards with which they had been just previously successful.

The factor of favorableness of stimulus refers to a quality of the stimulus by virtue of which it contributes toward the maintenance of the reacting organism. In experimental work such stimuli are known as lure or reward, the unfavorable stimulus is known as punishment or penalty. Blodgett (5) and Bruce (7) have experimentally demonstrated the influence of the introduction and withdrawal of rewards on the maze performances of white rats. Aylesworth and Warden (1) making a comparison study, found different effectiveness for stimuli of reward, punishment and combined reward and punishment. Warden (50) in an analysis and comparison of the persistence of various motivations in the white rat, found different scores for crossings over a standard electric shock resistance or obstruction to attain the following rewards, litter, food, water, opposite sex and exploration. Tsai (48) using various intensities of food content and salt concentrations as lures found evidence to support his law of "maximum satisfaction".

Superiority of organism refers to comparative independence of the animal in the battle for existence. More specifically it refers to the age and development of native and acquired equipment of the organism, by virtue of which it becomes more or less receptive of adequate stimuli, selects certain modes of attack, and achieves the solution of its problems. Experimental evidence of the factor of superiority in the appearance of differential emotional behaviors has been provided by the investigators about to be cited among many others. Thus, Johnson (27) established the relation between mental and physical growth, Gesell (19) has determined age levels for many behavior items of infants and young children. Thus for the "dangling ring" situation he has found different age levels for the onset of "regard", "reaching for", "grasping" and "dropping" the ring. Dawe (14) in an analysis of children's quarrels found that scores for provoking

quarrels, for aggressiveness, retaliation, forced yielding, and voluntary yielding vary with the age of the children. Cowan and Pratt (12) have reported differential scores for different ages of children at the problem of surmounting hurdles. Nielson and Cozens (32) constructing norms for physical activities involving competitive locomotion and large muscle skills found that superior performance correlates with age, height and weight. Among many references which might be adduced to show that organic inferiority and failure of maintenance follow the absence or loss of equipment, that of Nissen (33) will be cited here. This study demonstrated experimentally the diminution of characteristic sex behavior in the white rat as a result of gonadectomy and vasotomy.

With the influence of the three basic factors: (superiority of the organism, favorableness of the stimulus, and spatial relation between the organism and stimulus), in the production of emotional behaviors well substantiated by the above cited experimental researches, we may now rightly present the table for a natural classification of emotional phases, based on the same three operative factors. The space relation comprises the temporal period and the situational area in which the maintenance problem occurs. It is divided into four points, loci or zones of reaction. The factor of superiority has the two extremes of superiority and inferiority, with a middle degree of competence, called superiority-inferiority. The opposite extreme of the favorableness of the stimulus object is unfavorableness.

At the top of the table, reading from left to right are the four critical behavior points of the space relation factor, which constitute one cycle or period of situational points in which the organism always exists and reacts. The organism's differential reactions to these four situational points constitutes one psychological period of emotional behavior. The organism's transit through these four situational zones causes it to react from a phase of rest to orientation, approach or retreat, success or failure in conflict, and finally to adjustment and subsequent rest once more.

On the left are represented the competence levels of the organism, on the right the maintenance quality of the stimulus. Repetitions of a psychological period on the same level of organic superiority and stimulus favorableness produce rhythms of the same phases. Transits through the four spatial zones under changing conditions of organism or stimulus object will carry the animal through the whole array of the above listed emotional phases. In the columns of phases, the decisive behavior reac-

TABLE I.

A Periodic Table of Emotional Phases

Factor of Space-Relation	Point of Distant Fixation	Point of Locomotion to Obstruction	Point of External Contact	Point of Intimate Fixation	Factor of Stimulus's
Factor of Organism's					
Superiority	Orientation	Approach	Success	Adjustment	Favorable
	DESIRE	HOPE	DOMINANCE	ELATION	
Superiority-Inferiority	Orientation	Approach	Failure	Adjustment	Favorable
	DESIRE	HOPE	SUBMISSION	DELIGHT	
Inferiority	Orientation	Withdrawal	None	None	Favorable
	JEALOUSY	DESPAIR	NONE	NONE	
Inferiority	Orientation	Withdrawal	None	None	Unfavorable
	ANXIETY	FEAR	NONE	NONE	
Superiority-Inferiority	Orientation	Approach	Failure	Adjustment	Unfavorable
	REPUGNANCE	COURAGE	INHIBITION	DEPRESSION	
Superiority	Orientation	Approach	Success	Adjustment	Unfavorable
	REPUGNANCE	COURAGE	VENGEANCE	DISGUST	

tions are written in small type, *e.g.*, approach; while the common descriptive term for the three factors is written in capital type, below; *e.g.*, COURAGE.

In the above table it will be seen that the superior organism reacts in an approaching or attacking manner, and the ensuing conflict with an obstruction or resistant stimulus object ends in a success for the organism. The activity of the partially superior organism ends in a partial victory, compromise or submission with dependent maintenance. The completely inferior organism neither surmounts the obstruction nor attains the desired stimulus object. It continues suspended in a vicious circle of desire and despair, or anxiety and fear. The favorable stimulus has an attracting influence in all its factorial situations and yields satisfaction when attained in whole or part. The unfavorable objective has an opposite effect.

Among the listed phases, the outer columns are mild reaction phases, since they are essentially fixation states. The inner columns are of emergency behaviors and involve large muscle activities in overcoming obstructions and resisting stimuli objects. The three upper lines of phases yield satisfying experiences, the lower three are dissatisfying. The top and bottom lines of phases have dominance resemblances, the inner lines list the submissive behaviors, the innermost have no contacts with the stimuli nor permanent adjustments, they are deficiency reactions.

According to this table, fear is defined in terms of its factors as the behavior phase of an inferior organism making or preparing to make a retreating movement from a zone containing an obstruction or an unfavorable stimulus. Elation would be defined as the behavior phase of a superior organism having attained the zone of intimate contact with a favorable stimulus object. Inhibition might be described as the behavior phase of a semi-superior organism in external contact with an unfavorable object or a punishing stimulus, submission on the other hand would be a behavior phase in the same third zone of a behavior period, but the stimulus object would be favorable to the organism under the condition that it occupies nothing beyond a secondary place in a social hierarchy.

This table is offered to the reader as a graphic representation of what the author considers a natural classification of basic emotional states. Aware of the skeleton form of this table the author hopes its lacunae may be filled in and its extension developed, as is apparently necessary to make it more practical. It is likewise hoped, that the table will make possible a greater degree of cer-

tainty in diagnosing emotional states and in predicting their approach, and finally that it will help toward a quantitative measurement of emotional phases through the standardization of the three factors involved.

(Note: This paper in an abbreviated form was presented at the Pittsburgh Meeting of the American Association for the Advancement of Science, at the Section I, Sessions, December 27, 1934.)

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A FIELD EXPERIMENT ON THE COMPARATIVE EFFECTIVENESS OF "EMOTIONAL" AND "RATIONAL" POLITICAL LEAFLETS IN DETERMINING ELECTION RESULTS *

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THE EMERGENCE OF POLITICAL PSYCHOLOGY

POLITICAL psychology as a separate branch of scientific inquiry is all but non-existent. As an art or practice, however, it has long ranked among the essentials of statecraft and is now a powerful and flourishing factor in the intricate world of affairs. Dictatorships and democracies make different, but apparently equally extensive, use of it in the process of molding public opinion and shaping attitudes. Like all technologies, political psychology may be employed for a variety of ends—it is a "tool" skill for attaining efficiently the goals established by some sort of systematic or unformulated political philosophy.

By the very nature of the field which gives it its name, political psychology is bound to have close relations with advertising and salesmanship, two regions of modern commercial life in which applied psychology has been conspicuously influential. The practices of publicity, propaganda, and intentional indoctrination are the very life-blood of political activity and other "institutional" behavior—remove them and the human interests supporting even the worthiest of movements lose most of their power to affect the course of group conduct or even to maintain their own coherence. He who lacks control over the required stimuli cannot obtain the desired responses.

Despite the serious need for an organized corpus of knowledge about political psychology—which in this generation of large-scale "conflict" promises to become the most important single division of social psychology—the phrase itself is barely found in current usage. The available information and techniques comprising it

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[1] Performed while serving as a post-doctoral Fellow of the Advanced School of Education, Teachers College, Columbia University.

are loosely distributed in incoördinated fragments among experienced politicians, reflective journalists, and copy-writers, curious social scientists and an occasional laboratory man whose versatility or heterodoxy have allowed him to be sensitive to a broader range of interests. This is a strange circumstance when one recalls that American political parties, "machines" and individual candidates annually spend unascertained millions either to get or to hold public office with its associated benefits. A substantial fraction of this sum is undoubtedly sheer waste, not only from the standpoint of positive social gain, but even from the point of view of the seekers for power, irrespective of motive. If the direct and indirect expenditures involved in incessant campaigning were correctly totalled, they would probably approach in the aggregate the amount spent on public education in the United States. To enhance the efficiency of the latter process we have developed an army of educational psychologists and allied specialists, but neither the professions nor the universities recognize such an individual as the "political psychologist."

However, if psychologists on the basis of Strong's law can recommend that the small business man spread his modest budget for a little advertising over a number of periodicals rather than concentrating all in one journal, why should they not be able to guide a minority political party in using its limited funds to secure the maximum number of votes?[2] The social utility in both cases may be low, but it is surely no lower in the competitive political field of a democracy than in the competitive business sphere of our economic system. The politician would like to know more exactly the relative vote-getting strength of an equal expenditure of time, money, and effort on newspaper, billboard, radio, personal interview, and speech-making publicity, but the psychologist has given him little or no help in this or related matters.[3] So far as the writer knows, the present study is the first experimental[4] attempt to develop a *rapprochement* between the two fields of endeavor on other than insecure laboratory analogies.

[2] The Psychological Corporation through its national network of regional representatives is ideally organized to do such work.

[3] Perhaps an exception should be made of W. H. Wilke's "An experimental comparison of the speech, the radio and the printed page as propaganda devices". Archives of Psychology, 1934, No. 169.

[4] "Experimental" at least in the sense that deliberate intervention in a pre-election situation was planned. This distinguishes it from the post hoc researches of the type reported by Stuart Rice in his Quantitative Methods in Politics, Knopf, 1928.

WILL "APPEALS TO REASON" OR APPEALS TO THE EMOTIONS WIN MORE VOTES?

Both Gestalt theory and the doctrine of the "total situation" have shown that the capacity of apparently "identical" stimuli to evoke certain desired responses is dependent upon the setting, context, or "manner" in which they occur. Will an appeal, request, or command to vote for a certain party, policy, issue, or individual be more influential when it accompanies or follows a logical exposition of the case or when it appears with or after an emotional approach to the unanalyzed existing loyalties of the voter? The question as phrased implies an extreme dichotomy and opposition between the two types of mental process, whereas it is more likely that the real "contrast" is between two appeals containing various combinations of rationality and emotionality. The contrast here proposed is between a complex fusion of excitement, resentment, vague enthusiasms, strongly aroused fears and hopes, and a calm, orderly, and restrained presentation of either concrete proposals or abstract objectives. It does not take a high degree of psychological sophistication to bet (other things being equal) on the greater strength of the "emotional" attack with any random sample of the American population. However, it is important to remember that this prediction rests exclusively upon theoretical and empirical considerations, and not upon the measured findings of any deliberately devised experiment on the problem of political behavior under complex motivation. It is this kind of confirmation which the investigation here reported seeks to supply.[5]

THE 1935 ELECTION SITUATION IN PENNSYLVANIA

The possibility of a really effective test was provided by the local and state elections held in Pennsylvania on November 6, 1935. At the time, many municipal and county offices were to be filled, as well as two important state-wide judgeships. Because it met certain extraneous considerations, such as ease of access for the experimenter, the use of voting machines, which are generally believed to enhance, if they do not guarantee, the accuracy of the

[5] Similar researches could be built around such pairings as the relative effectiveness of constructive vs. destructive political appeals, emphasis upon "ideas" versus personalities, the use of praise and blame, the strength of group vs. self interests, material vs. "spiritual" incentives, and even the specific advantages of placards with and without the portraits of candidates. Our existing knowledge of these matters is exceedingly shaky.

poll, etc., the city of Allentown in Lehigh county was chosen as the scene of operations. For a similar variety of reasons the Socialist party in that community was made the beneficiary of the special appeals whose relative potency was being measured. The local Democratic and Republican parties were so closely matched that any publicity which would have favored one rather than the other would have created an intolerably delicate situation for an experimenter whose motives could hardly have been made clear or acceptable to a suspicious populace.[6] The Socialist party, on the other hand, was admirably suited to this purpose, since it was universally agreed that its candidates were not likely to win in this area; its exaltation of principles and ideals over individual standard bearers made possible more sharply defined contrasts without the danger of wounding personal feelings.

PREPARATION OF THE MOTIVATING STIMULI

The next task was the construction of the contrasting leaflets. This was much harder than anticipated because a search through Socialist propaganda "literature" gave types of printed appeals which were too mixed and "impure" in style, content, and length to meet the prescribed conditions. Consequently, the experimenter wrote the texts for three pairs of emotional and rational leaflets of the desired brevity. These were submitted to thirty rank-and-file adults in Allentown; the pair finally used was the pair overwhelmingly adopted by them as the most "liked". Inspection showed that the rejected leaflets had a more involved sentence structure, heavier vocabulary burden, and lower persuasiveness than those retained. Six competent psychologists agreed that in the pair finally selected, one—the academic "test" involving some reflective judgment—was predominantly "reasonable" in character, and the other—an intimate family letter—mainly "sentimental".

Five thousand copies of each of the two appeals were printed on heavy white paper in identical typography in the form of a four-page (one sheet folded) leaflet, the cover pages bearing the titles, "Try this test on yourself" (= rational) and "Will you answer this letter?" (= emotional), respectively. The two inside pages are reproduced below. The last or back page simply bore a straightforward list of the party candidates with the respective city, county, and state offices opposite their names.

[6] The present writer was the 1935 Socialist candidate whose vote appears in the tables below. This union of psychologist and "politician" explains how the present study came into being.

You've heard of intelligence tests, haven't you? Well, we have a little examination right here which we are sure you will enjoy taking, even if you didn't care much for school when you were a youngster. The beauty of this test is that you can score it yourself without any teacher to tell you whether you passed or failed.

This is how it works. First read each one of the seven statements printed below. If you *approve* the idea as it stands, *underline* the word AGREE; if you *disapprove* of the idea, underline the word DISAGREE. Simple, isn't it? All right, then. Get your pencil ready. All set? Go!

1. We would have much cheaper electric light and power if this industry were owned and operated by the various governmental units for the benefit of all the people. AGREE—DISAGREE.

2. No gifted boy or girl should be denied the advantages of higher education just because his parents lack the money to send him to college. AGREE—DISAGREE.

3. The Federal Government should provide to all classes of people opportunity for complete insurance at cost against accident, sickness, premature death and old age. AGREE—DISAGREE.

4. All banks and insurance companies should be run on a non-profit basis like the schools. AGREE—DISAGREE.

5. Higher income taxes on persons with incomes of more than $10,000 a year should be levied immediately. AGREE—DISAGREE.

6. The only way most people will ever be able to live in modern sanitary homes is for the government to build them on a non-profit basis. AGREE—DISAGREE.

7. Many more industries and parts of industries should be owned and managed co-operatively by the producers (all the workers) themselves. AGREE—DISAGREE.

Have you answered them all? Fine. Now go back and count the number of sentences with which you AGREED. Then count the number with which you DISAGREED. *If the number of agreements is larger than the number of disagreements, you are at heart a Socialist*—whether you know it or not!

Now that you have tested yourself and found out how much of a Socialist you really are, *why don't you try voting for the things you actually want?* The Republicans and Democrats don't propose to give these things to you, because a mere look at their records will show that they are opposed to them. Do you get the point?

HELP BUILD THE AGE OF PLENTY!

VOTE: SOCIALIST | X

Allentown, Pennsylvania
November 1, 1935

Dear Mother and Father:

We youngsters are not in the habit of giving much thought to serious things. You have often told us so and we admit it.

But while we like to play football and have a good time dancing and cause you a lot of amusement as well as worry with our "puppy loves," we sometimes think long and hard. You ought to know what many of us young folks are quietly saying to ourselves.

Our future as American citizens in 1940 looks dark. We want jobs—and good jobs, too—so that we can help in the useful work of the world. But we know that many of our brightest high-school and college graduates find it absolutely impossible to get any kind of employment. We also know that this condition is not temporary, but that it will last as long as we stick to harmful ways of running business, industry and government.

We want to continue our education, but we haven't the heart to ask you to make that sacrifice. With Dad working only part-time on little pay and Mother trying to make last year's coat and dress look in season, we feel we ought to pitch in and help keep the family's neck above water. But we can't. The world as it is now run has no use for us.

Many of our teachers know what is wrong, although we can see that most of them are afraid to say what they really think. Luckily, the text-books and school magazines

keep us in touch with new ideas, and we have learned how to read between the lines of the ordinary newspaper. Please don't be frightened if we tell you what we have decided!

We young people are becoming Socialists. We have to be. We can't be honest with ourselves and be anything else. *The Socialist Party is the only party which is against all wars*—and we have learned from our history courses what awful wars have taken place under both Republicans and Democrats. We refuse to be slaughtered (like Uncles Bob and Charles were in 1918) just to make profits for ammunition manufacturers.

The Socialist Party seeks to create a world in which there will be no poverty. In our science classes we learn how power machinery and other modern inventions make it possible for all of us to have enough of all the goods and services we need. Yet look at our town with its unpainted shacks, suffering parents, half-starved children! We might have everything, but we continue to live on next to nothing.

It is all so unnecessary. You have had to lead a poor workingman's life, because you and most of the workers and farmers of this country have regularly voted for either the Republican or Democratic parties, between which there is no real difference. These old machines are not for us.

The youth of 1935 want to Build a Better America, in which there will be no poverty, no fear of unemployment, no threat of war. We ask you to follow the lead of the Socialist Party this year because that is the most direct way for you to *help hasten the day when Peace and Plenty and lasting Prosperity will be the lot of all men.* Good parents such as you desire these things for us. But we can never have them as long as you are controlled by your old voting habits.

We are profoundly earnest about this. Our generation cannot enjoy the beauty and justice of the *New America* if you block our highest desires. There was a time when you too were young like us. We beg you in the name of those early memories and spring-time hopes to *support the Socialist ticket in the coming elections!*

Your Sons and Daughters

VOTE: SOCIALIST X

COMPOSITION OF THE TESTING POPULATION

Having settled upon the differential stimuli, the next step was the mapping out of the city into experimental and control areas. The variations in the size of the wards, density of population, assessed real-estate valuation, previous voting habits, and presumptive socio-economic status made the problem of establishing "comparable" groups unexpectedly difficult. While it is not pretended that all the obstacles were overcome, a feasible apportionment consisted in matching wards 2, 9, and 10 (= the emotional) with wards 3, 4, 5, and 7 (= the rational); the remaining twelve wards (there are nineteen in all) were simple "controls". The two experimental regions consequently had the nature of adjacent islands in a large control sea. Table I contains some of the relevant data concerning these three areas which may be used in interpreting the results.

APPLICATION OF THE STIMULUS PATTERNS

The stimulation plan consisted in distributing the two sets of leaflets in their assigned districts so that every family residing therein would be affected. The distributors were interested

adults, all party members, who discharged their task by giving the recipient the leaflet with a polite request that it be read when convenient. If no one was at home to receive the leaflet in this manner, it was simply thrust under the door. About one-half of the prospective voters was given the leaflet in person; the other half presumably found it upon returning home. The material was all distributed between Monday and Thursday of the week preceding Election Day. Apart from a few radio talks, which affected the entire city uniformly, no other campaign activity or proselytizing was carried on during this season.

RESULTING CHANGES IN THE PROPORTION OF VOTES RECEIVED IN THREE AREAS

The reaction to such stimulation with a specific purpose can be tested only at the ballot-box, *i.e.*, the final measure of belief or conviction is the readiness and willingness to act. Here we need to know not only the present vote, but also the base-line or reference vote of the preceding year. This has to be calculated in terms of percentages because of the fluctuating participation of the electorate in successive years. Schematically, a clear-cut check would be provided if in 1934 the Socialist vote in Allentown as a whole were 4 per cent of the total for all parties and if in 1935 it were 5 per cent in the rational wards, 6 per cent in the emotional wards, and 3 per cent in the control wards (assuming statistically reliable differences). This comparison made it necessary to contrast figures for the state-wide "heads of the tickets" which in 1934 were the governor and in 1935 the judge of the Supreme Court. Other offices fluctuate slightly from the figures for the party candidates for these leading positions. Table I contains the necessary data for an appraisal of the effect of the two kinds of propaganda.

ANALYSIS OF THE TABULAR RECORD

The first item to be noted is that the total vote cast increased by 3,594, or 16.69 per cent, from 21,533 in 1934 to 25,127 in 1935. This decided increase in public participation is a fact which complicates the remaining calculations. The official Allentown registration list contained 34,424 names—17,236 Democrats, 15,001 Republicans, and 187 Socialists. The Socialists polled about three and one-half times as many ballots as they had registered adherents, while the other two parties received from two-thirds to four-fifths of their overt registration. This is a common American

TABLE I

COMPARATIVE INCREASE IN VOTING BEHAVIOR UNDER DIFFERENTIAL STIMULATION

WARD	VOTE FOR GOVERNOR, 1934			VOTE FOR SUPREME COURT JUDGE, 1935			ASSESSED VALUATION PER CAPITA	INHABITANTS PER ACRE
Rational	Democrat	Republican	Socialist	Democrat	Republican	Socialist		
3	384	378	4	518	496	14	$1,663.64	32.51
4	402	347	10	374	381	8	2,786.19	44.08
5	283	209	14	320	321	19	3,094.01	40.70
7	484	556	20	575	650	24	1,478.73	41.40
	1553	1490	48	1787	1848	65	2,070.12 (Mean)	38.44 (Mean)
Per cent of Party Total	14.38	14.56	9.62	14.63	15.08	9.95		
Raw increase				234	358	17		
Percentage increase				15.07	24.03	35.42		
Emotional								
2	497	311	30	541	302	33	1,581.26	29.44
9	618	284	16	666	337	29	851.69	43.89
10	1188	623	64	1282	828	103	615.82	38.37
	2303	1218	110	2489	1467	165	871.72 (Mean)	37.28 (Mean)
Per cent of Party Total	21.32	11.90	22.04	20.37	11.97	25.27		
Raw increase				186	249	55		
Percentage increase				8.08	20.44	50.00		

TABLE I—Continued.

Ward	Vote for Governor, 1934			Vote for Supreme Court Judge, 1935			Assessed Valuation Per Capita	Inhabitants Per Acre
Control	Democrat	Republican	Socialist	Democrat	Republican	Socialist		
1	502	408	25	512	422	39	$941.34	11.82
6	591	177	23	782	114	18	624.80	15.97
8	1383	1371	101	1635	1835	110	721.53	24.06
11	1264	2358	28	1430	2648	47	1,202.87	20.23
12	605	419	51	665	606	49	1,089.54	3.36
13	748	1206	19	730	1399	22	1,264.51	18.83
14	577	208	48	626	277	64	704.56	6.35
15	507	436	25	551	472	32	1,021.68	2.01
16	341	186	13	468	268	22	556.76	4.85
17	160	408	1	167	428	2	2,380.04	2.24
18	67	158	—	83	171	1	447.78	10.50
19	200	190	7	291	303	17	773.89	13.42
	6945	7525	341	7940	8943	423	946.19 (Mean)	7.58 (Mean)
Per cent of Party Total	64.30	73.54	68.34	65.00	72.96	64.78		
Raw increase				995	1418	82		
Percentage increase				14.33	15.86	24.05	1,088.08 (City Mean)	10.17 (City Mean)
Party Total	10,801	10,233	499	12,216	12,258	653		
Per cent of all ballots	50.16	47.52	2.32	48.62	48.78	2.60		
Raw increase				1415	2025	154		
Percentage increase				13.10	19.79	30.86		

phenomenon, since economic discretion probably causes many Socialist sympathizers to enroll on the other lists. Even in the nearby city of Reading, which has had Socialist administrators and consequently greater party prestige, the Socialist vote normally trebles its registration.

The second fact to be observed is that the Socialist vote in Allentown as a whole (and even in the control wards where there was no definite "activity") rose proportionately more than did that of the other parties.[7] With about 17 per cent more general participation in 1935 than in 1934, the total Socialist vote increased 30.86 per cent, the Republican 19.79 per cent, and the Democrat 13.10 per cent, indicating a relative loss for the last party despite an absolute gain. The crucial detail for our purpose is that the Socialist vote in the "emotional" wards rose 50 per cent, in the "rational" 35.42 per cent, and in the control 24.05 per cent—all differences large enough to be reliable even though no single adequate measures of this are applicable. This is wholly in harmony with the predicted outcomes and is a gratifying confirmation of the general hypothesis. The relations may be seen more clearly from an inspection of Figure 1.

Although the use of percentages rather than absolute figures may create a faulty emphasis, these diagrams nevertheless portray best the main finding of this study, viz., that specific "revealed" propaganda definitely accelerates a tendency already present. This general "secular" trend, of course, may in turn be due to widespread contributory propaganda of a more diffuse sort.

The efficacy of these two leaflets may be brought out more fully by comparing the actual with the predicted increases of each party's total vote in the various regions under consideration. This has been done in Table II.

If the $\frac{\text{Actual}}{\text{Expected}}$ ratio is 1.00, this means that the two values coincide; if it is less it means that the party involved obtained less than its proportionate share; if more than 1.00, the party affected gained "unduly". Since they are based upon the same raw data, these computations tell essentially the same story con-

[7] Does this mean that the larger the total participation in balloting, the greater will be the relative minority vote? Is it not possible that the customary non-voters are more plastic in their political convictions, and that they contain a proportionately larger number of protest and opposition voters who usually refrain from exercising the franchise because of a sense of futility? In this case, only severe social crises will bring them out. Cf. the extraordinarily high rate of suffrage utilization in Germany from 1918 to 1933.

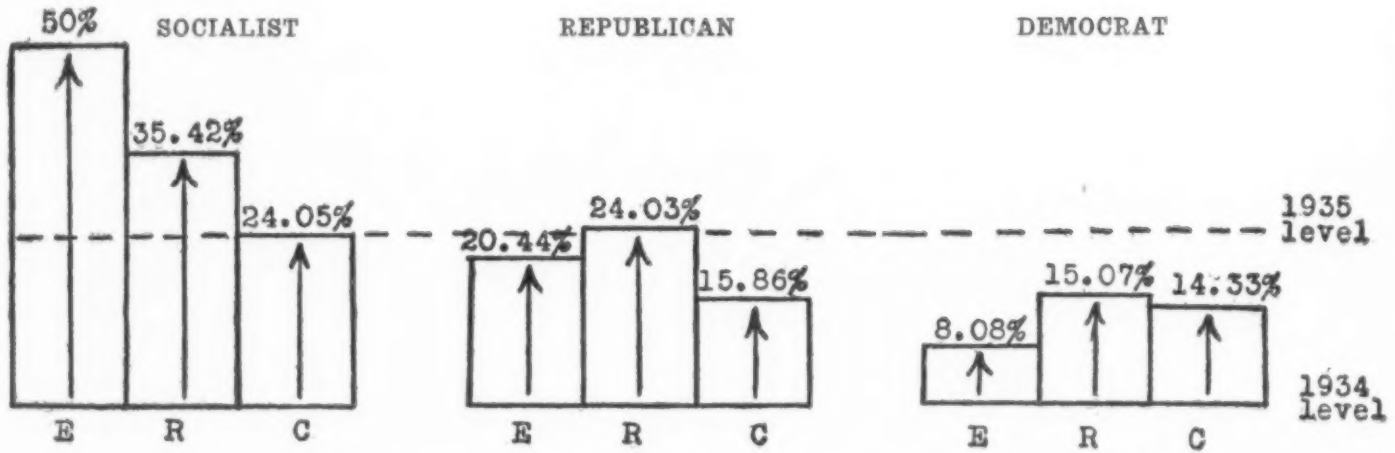

FIGURE I.—Rough schema indicating differential gains in voting preference under various types of stimulation. Although all parties received more votes in 1935 than in 1934, the Socialists gained relatively more in the areas where "emotional" (E) and "rational" (R) appeals were used; (C) stands for "control" district.

veyed by Figure 1. The increase in the Socialist vote in the "rational" and "emotional" areas was about two or three times, respectively, its probable gain if these stimuli had been omitted.

SOME NECESSARY PRECAUTIONS AND CORRECTIONS

In order to correct for the inevitable exaggerative effect which such phrases as "per cent of gain" evidently produce, Table III has been prepared. This should effectively dispel the spurious impression of a "landslide" suggested by some types of comparison.

TABLE II

HOW THE THREE PARTIES FARED IN THREE DIFFERENTLY TREATED AREAS

Party	District	1934 Vote	1935 Vote	Expected Increase	Actual Increase	A-E	A/E
Socialist	Rational	48	65	8	17	9	2.13
	Emotional	110	165	18	55	37	3.06
	Control	341	423	57	82	25	1.44
	Entire City	499	653	83	154	71	1.86
Democrat	Rational	1553	1787	259	234	—25	.94
	Emotional	2303	2489	384	186	—198	.48
	Control	6945	7940	1159	995	—164	.86
	Entire City	10801	12216	1803	1415	—388	.78
Republican	Rational	1490	1848	249	358	109	1.44
	Emotional	1218	1467	203	249	46	1.23
	Control	7525	8943	1256	1418	138	1.13
	Entire City	10233	12258	1708	2025	317	1.17

Note: The "Expected Increase" column is obtained by multiplying the 1934 vote by the coefficient of increase in public participation, viz., 16.69.

TABLE III

PER CENT WHICH SOCIALIST VOTE IS OF TOTAL FOR ALL PARTIES IN DIFFERENT SECTIONS OF ALLENTOWN

	1934	1935
Control wards.	2.30	2.44
Rational wards.	1.55	1.76
Emotional wards.	3.03	4.00
Entire City.	2.32	2.60

If we select the most favorable showing—that made in the "emotional" district—we see that the effect of the leaflet has been to make one voter out of every twenty-five support the Socialist ticket where before only one person in thirty-three had done so. Had no leaflets been distributed at all, the entire Socialist vote presumably would have been 619 (*i.e.*, 499 plus 499 x 24.05, the control rate of increase); if the superior emotional leaflet had been spread evenly throughout the town, the probable total would have been 749 (*i.e.*, 499 plus 499 x .50); actually, under the mixed

conditions obtaining where most of the community was the "control", the total was 653.

Because of the selective treatment which these leaflets received, they may be presumed to be above the average of their kind. Nevertheless, even these relatively good broadsides have an "efficiency" of but one-half of 1 per cent, since it took 10,000 leaflets to produce 72 additional votes in the emotional and rational wards combined. Moreover, about half of these added votes were "in the bag" anyhow because of the general situation. It may be estimated that one person in 200 who would not otherwise have voted Socialist was impelled to do so by virtue of the motivation directly traceable to these leaflets. Since it took an absolute commercial minimum of one cent per leaflet for printing and delivery, it will be seen that even this cheap form of legitimate political propaganda costs about three dollars for each additional party voter it secures.[8] To be sure, this stimulation probably has some deferred propaganda value in the sense that cumulative increments at some later date may be made to function more readily because of the "summation of stimuli" involved.

CONFIRMATORY POST-ELECTION INTERVIEWS

About two weeks after Election Day, personal interviews were arranged with 45 householders (22 men and 23 women) chosen at random from different streets in the rational and emotional districts. It seemed desirable to supplement the objective record of the polls with some qualitative clues as to the way in which the personalities of the voters had been affected by these appeals. Four simple questions were asked of each interviewee with the results shown in Table IV.

Incomplete as this evidence is, it shows plainly the greater impressive and retentive effect of the sentimental appeal. It is axiomatic that a piece of "printed salesmanship" must be attended to and remembered before the message it contains can achieve the end desired by the purveyor. This the emotional leaflet did much more decisively than the rational one, even though both produced more pure "good will" than immediately significant action. As soon as reasonable certainty was attained on these points, the interviews were discontinued, since additional cases did not promise to yield any new information.

[8] Cf. the expenditure estimate given in the third paragraph of this article. Congressional and legislative limitations on campaign expenditures are notoriously ineffective because of the many exemptions provided, the failure to include "voluntary" services, etc. The full cost per major party vote is many times that of the minority vote.

SOME WEAKNESSES AND OBJECTIONS

Although this study bears the formal pattern of the familiar parallel-group experiment, it rests upon an exceedingly imperfect matching of the contrasted populations. The mean density of population in the emotional and rational wards was purposely kept practically identical, but the latter region has more than twice the per capita real-estate valuation of the former (tax exempt property is excluded in these calculations). In matching for one

TABLE IV

RESPONSES OBTAINED IN FOLLOW-UP INTERVIEWS FOR DETERMINING THE IMPRESSIVENESS OF TWO TYPES OF CAMPAIGN LITERATURE

Question (given orally)	Reply
1. Do you remember receiving any Socialist literature recently?	29 out of 45 answered "Yes"
2. What was its nature?	8 out of 12 in the emotional wards said, "An open letter"; only 7 out of 33 in the rational wards knew it was a pamphlet or folder, and only one said it contained "questions"
3. Did the literature you read influence you to vote for any Socialist candidates?	Four said it made them "split" their votes for the first time; no effect on others
4. What did you think of the Socialist literature you saw?	24 said they were "not interested"; 6 said it contained "good principles"; 4 said "very good"; 2 said they would never read any Socialist material; 1 said it was "too deep, he couldn't understand it"; 8 others expressed some degree of favor

factor, we have unmatched for another. Are not the preëxisting attitudes of prospective Socialist voters strongly affected by their economic status?

The answer, of course, is a qualified "Yes", but this does not mean that there is an inverse relation between receptivity to the Socialist appeal and financial well-being. Observation indicates that the correlation is zero or slightly positive. Both the well-to-do and the poor may be persuaded to vote Socialist, although they may respond differentially to a specific approach.[9] The control group occupies the same financial level as the "emotional" popula-

[9] It may be necessary to remind the reader that the Socialist vote does not come primarily from the "disinherited" or underprivileged. A glance at the returns from poverty-stricken areas, both urban and rural, shows this plainly. Socialist sympathizers in the universities are proportionately greater than among the general public; American labor unions are still strongly non-Socialist, if not anti-Socialist; and Dr. George Gallup of the American Institute of Public Opinion found that 82 per cent of the people now on relief voted Democratic in 1932.

tion, but because of the absence of stimulation no comparable voting increase occurred. To be sure, the rational group did not gain as much as the emotional one, but this was not due to its superior economic position—these people were simply bombarded with an inferior instrument.[10] Absolute assurance that this interpretation is correct can be obtained only by reversing the appeals in another community.

Admittedly, pure experimental conditions are hard to maintain in a study of this sort, but it is an unscientific counsel of despair to refrain from using to best advantage whatever approximations thereto one can achieve. Election results are not the outcomes of single stimulation—they resemble more a complex resultant of intricate forces. Thus, energetic Socialist propaganda would undoubtedly call forth more effort from the other parties, but that would probably occur only where they sensed a genuine threat to their position, which was not the case in this city.

CONCLUSIONS

There seems to be no escape from the decision that the emotional political appeal is a better vote-getting instrument than the rational approach, at least in the sense in which these terms describe the essential difference between the two leaflets reproduced above. The sentimental open letter integrates itself easily with such strong permanent central attitudes as parental affection and the desire for a "better life". It employs a familiar literary form, is concrete in imagery, "breathes sincerity", and is not obviously or even basically untrue. It is interesting because it digs deeply into the inner personality and links Socialism with some vital needs.

The "intelligence test", on the other hand, is straightforward, matter of fact, and unexpectedly manoeuvres the reader into an acknowledgment that he is more of a Socialist than he realizes.[11] Save for a faint inferiority feeling which this form may create, these features are positive advantages, although they evidently do not outweigh the factors of strength in the other leaflet. Thus

[10] As a matter of fact, the per capita valuation per resident is a misleading index to the apparent wealth of the rational group. These wards are in the downtown business section where rented apartments above the ground floors are the commonest type of housing. The buildings are largely owned by persons living in the control wards.

[11] The seven propositions which appear in this appeal are items favored by a definite majority of sample Pennsylvania populations. Hence, the high probability of obtaining a preponderance of "Agrees" from a new random selection. Otherwise, they would have been to risky to use. With many individuals, of course, these statements definitely prejudice the case "against" rather than "for".

the ancient educational maxims of the Herbartians are vindicated anew in the field of political psychology! Those ideas will be most readily assimilated by the voter which fit in with his present "apperceptive mass", which are joined with some prepotent wants, which meet him on his own level and lead him on from where he is.

From a certain point of view, this investigation may be considered a research in "political pedagogy". Thorndike has repeatedly insisted that "education is a process of changing human beings for the better", and much of current educational technique consists in discovering and applying ways for making these modifications more efficiently. Political propaganda for good or ill does more to influence people's knowledge and attitudes in the field of the social sciences than all the formal educational apparatus of our time. Since so many desirable social changes are not made because the public refuses to admit that they would constitute an improvement, it is important for educational statesmanship to know what *means* of persuasion will increase the probability of realizing these *ends*. The present problem is just one aspect of this larger issue.

SUMMARY

During the election campaign of 1935, the city of Allentown, Pennsylvania, was divided for experimental purposes into three types of wards: 1, an "emotional" area in which all the resident adults received leaflets written in vigorous advertising style urging support of the Socialist ticket; 2, a "rational" region, in which a more academic type of persuasion was used; and 3, a control district where nothing was distributed. The increase in the minority party vote was greatest in the emotional wards, next largest in the rational wards, and lowest in the control wards. These facts may constitute a significant beginning for an experimentally grounded political psychology and pedagogy.

ON THE A PRIORI PROBABILITY OF TELEPATHY

By HOWARD BYINGTON HOLROYD, PH.D.

IN his article, "A Critique of Rhine's 'Extra-Sensory Perception' ", published in Vol. XXX, No. 2 of THE JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY, Dr. R. R. Willoughby made the following statement in regard to telepathy and clairvoyance: "That such a mechanism is *a priori* extremely improbable need hardly be said." He did not state how he reached this conclusion. Perhaps a student of the physical sciences may be able to say something of value in regard to the possibility for the existence of telepathy. The conclusion of this article is that the *a priori* probability for telepathy is very great.

In all scientific studies we should avoid the mental attitude of the Kansas farmer who went to a fair and obtained for the first time a close view of some airplanes. He admitted he thought that a little one could fly, but he expressed his opinion in no uncertain terms that the very large airplane could not fly and that it must have been brought on a train. In a few minutes the pilot of the large one drove it down the field and took off as easily as a bird, and the farmer was heard to say, "I won't believe it anyway." In such cases as throwing loaded dice, the probability that they are not loaded may be made arbitrarily small by throwing them enough times and observing the results.

Is there any *a priori* evidence that telepathy is possible? Let us consider some facts. We know from experiments in physiology that the thermal efficiency of living organisms in converting the chemical energy of foods into mechanical energy is rather large. Since they have no large differences in temperature, which are necessary for obtaining high efficiencies with heat engines, we know that they are not heat engines, and therefore that they must use some process other than the conversion of the chemical energy into thermal and the thermal into mechanical. The only known process which can give a high efficiency without a large difference in temperature is the conversion of the chemical energy into electrical and the electrical into mechanical. There is therefore very good evidence for the conclusion that organisms produce and control electrical energy. Our bodies are electrical machines.

This conclusion is supported by the fact that there are organ-

isms, for example the electric eels, which produce and use electricity as a means of defense and offense. It certainly is a fairly good guess that what one organism can do well, others can do to some extent. Furthermore, it has been demonstrated in recent years that pulsating electric currents pass along the nerves.

If telepathy exists and if known physical processes are used, the communication of thoughts must be done by electromagnetic waves, for no other means will give noticeable effects at great distances. We know from experiments that organisms produce and control electrical energy, and the natural suggestion is that telepathy by means of electromagnetic waves is possible.

From the facts of electrodynamics, we know that pulsating electric currents always radiate at least a small amount of energy; in fact, it is impossible to prevent the radiation completely. If the theory of the behaviorists, that thinking is always accompanied by small muscular movements, is correct, or if the brain theory of thinking is true, it follows that our thoughts, to some extent, must be radiated into space. Furthermore, the form of the nervous structure is such that it should make a good radio antenna.

As a matter of fact we know that some organisms, such as certain fish and glowworms, do use light, which is electromagnetic energy, for sending signals. Our eyes are capable of using only about one octave of electromagnetic frequencies, but many octaves are known to exist. If we had proper eyes of sufficient sensitivity to give sensations of the energy radiated by the nervous system, we would see that the thinking person glows with thoughts. Perhaps a subconscious realization of this is the reason that an intelligent person is sometimes called bright.

From the facts of electrodynamics we know that a physical structure must be rather large to radiate or to receive effectively radiations of long wave lengths, and therefore, if they are used for communication, we should not expect to find small organs for this purpose. The physical facts indicate that the nervous system is the best structure for this purpose.

We know also that when electromagnetic waves affect electrically conducting systems they produce currents in them of the same frequency, or frequencies, as that, or those, of the electrically vibrating source. This means that if there is a one to one correspondence between thoughts and electrical nerve currents the radiated energy will produce similar nerve currents in other people and these may bring to mind the same thoughts.

Another point should be considered. Photographic plates are

better than eyes for making astronomical observations, not because the plates are more sensitive than eyes which is not the case, but because the former can integrate the effects of the light over a long period of time while the latter cannot. The amount of energy radiated from the nervous system is probably very small, and the amount received by other persons is probably very much smaller, but if the effects can be integrated over a long period of time, which certainly does not appear to be impossible, they may be noticeable. It is known that some physiological and psychological processes, such as fatigue and learning, are cumulative, and this indicates that the means for integrating the effects of small electromagnetically induced nerve currents may exist. It is probable that the very delicate structures of living organisms are sensitive to some things which cannot be observed indirectly by the use of comparatively crude physical apparatus.

Very little of the energy which operates the loud speaker of a radio receiving set comes from the apparatus used in broadcasting. The energy received by the antenna is used to control a much larger amount from batteries or from the electric lighting system. The mechanisms which use a small amount of energy in this way to control a much larger amount are called servo-mechanisms. The energy of the nerve currents used to cause the muscles to act appears to be very small relatively to the muscular energy; this is clearly a case of the use of some kind of a servo-mechanism by the organisms. In the case of radio communication, it would be impossible to estimate the distance from the receiving set to the broadcasting antenna unless the degree of amplification of the receiving set was known. Similarly, since a servo-mechanism may be used by organisms, it may be impossible to find any effects of distance in telepathy by electromagnetic energy. Furthermore, if a means for integrating the effects of induced nerve currents exists, the effects of distance will be nullified. In other words, if telepathy by electromagnetic waves exists, there is no good *a priori* reason for expecting to find that the effects are proportional to the inverse square of the distance of one person from another.

From these facts it appears that telepathy by electromagnetic energy is possible, and it is highly probable that some of the organisms do use it, although such waves may travel too far to make them very good for mating signals, etc. . . . However, since organisms seem to have a way of using all possibilities, it is a good guess that such organisms will be found if a search is made for them. As we have seen, the organisms seem to possess the

required elements for a proper system of electromagnetic communication, and it appears that the only question which needs to be answered by direct experiments with organisms is whether or not the effects are large enough to be observed. The *a priori* probability for telepathy by electromagnetic waves is so great that the physicists certainly should not be astonished if its existence is proved; in fact, they should be more astonished if it could be proved that it does not exist.

Although physics is the most highly developed branch of science, the experimenters in other branches should not take it for granted that the physicists have found all of the raw facts which must be considered in forming a complete picture of the universe including man. The physicists' conceptions of time, space, and matter may not be entirely true, and they may be far from complete. The physicists have not proved that space has four dimensions; all that they have demonstrated is that this number of dimensions is sufficient for correlating certain experimental facts. There is always the possibility that the discovery of more facts will make it necessary to change the present conceptions. The physicists would be very much interested if it could be proved that telepathy exists and that it is not simply a case of the use of electromagnetic energy.

A good theory should suggest further experiments. The theory that telepathy by electromagnetic energy exists suggests that the effects should be increased if a number of people will have the same mental pictures at the same time since this should increase the amount of radiation. However, this is not necessarily the case, since it may be similar to using many different voices. Since people are not identical, we should expect to find the effects only between certain people, or greater effects between certain people than between others. Probably the amount of energy which is radiated increases according to the degree of emotion, and therefore the experimenters should try to find symbols with which powerful emotions are associated.

We should expect to find greater effects between "identical twins" who have been raised together than between other people, for their bodies are more nearly identical and they are more likely to use the same mental pictures. To use such twins in experiments is perfectly satisfactory; we do not argue that striking a billiard ball on one table should cause a very similar ball on another table to move.

The people who take part in the experiments should know each other intimately, for it may be as necessary to be able to

recognize the person from whom the waves start as it is to be able to recognize certain voices.

Systematic errors must be avoided. In an electric bell is used to transmit a signal from the person who is trying to transmit a thought to the one who is trying to receive it, it is necessary to use some automatic device to make the time of ringing the same in all cases, for we are able to detect differences in intervals of time and these could be used as a code.

While a proof of the existence of telepathy will not necessarily be very interesting to the physicists, so long as they stay within the limits of their branch of science, it should be very interesting to the psychologists, sociologists, and the philosophers, and therefore a careful investigation is needed. To sociologists it would mean that mankind forms a definite system in which the thoughts of each person may affect the thoughts of every person, and it would give an explanation for some very odd facts. It would mean that we could not prove that we do our own thinking. It is rather strange to think of people as broadcasting stations radiating their thoughts into space where they may exist as electromagnetic waves for ages and perhaps forever!

BOOK REVIEWS

PSYCHOLOGY: A Factual Textbook. Boring, E. G., Langfeld, H. S., and Weld, H. P., Editors. New York: John Wiley and Sons, 1935. Pp. viii + 555.

This encyclopedic book is the work of eighteen contributors, each chapter being written by a specialist in his own field. The editors, besides being responsible for three of the chapters, undertake a novel task in the field of introductory texts. They state in the preface that "experimental psychology has reached the stage of maturity. . . . We have felt that the facts should be presented . . . in terms free from bias of metaphysical presuppositions or of psychological systems. . . . Our aim has been to present such a factual text as one would expect from a science." It is a challenge to psychology to see whether such a feat can be accomplished in the present stage of development. This book, in the reviewer's opinion, suggests that the feat is difficult if not impossible.

The editors are the first to admit that there is in the book "an uneven balance among the various chapters". But they claim that this is "a fault of psychology and not of the authors". Thus nine of the nineteen chapters deal with the problems of sensation and perception. So far, so good—it is obvious that the emphasis accorded these problems may be interpreted as reflecting the vast amount of material available in these fields. However, in other chapters, we find for example four pages devoted to conditioning, about seven to intelligence, three to the problem of heredity and environment. It would seem difficult to defend the position that the difference in emphasis is due solely to the availability of the material and not to the theoretical interest of the editors and authors.

The problem of "freedom from bias" affects the book in two ways. The editors chose the authors, and the authors in turn chose their material to be included in particular chapters. Thus the chapter on learning, written by McGeoch, might conceivably have been very different if the task had been assigned to Lashley or Hunter or Holt or Wheeler. The systematic position of the author, much as he might like to keep it in abeyance, would lead him to a choice of experiments and explanations which would seem to him significant. In the chapter under discussion hardly any use is made of the extensive material on animal learning. Further, when stating that the conditions necessary for learning are temporal sequence, associative spread, motive, and frequency, or that what the Gestalt psychologist describes as insight may be thought of as transfer or associative spread, the author certainly does take a theoretical position.

It is debatable whether the presentation of merely factual material to the elementary student who has no theoretical orientation achieves the best result, even if and when it can be done. After all, a good many

experiments grow out of a systematic position, and in presenting them out of their theoretical context one is likely to strip them of some of their significance. For example, it might be argued that the subject of color, brightness, and size constancy treated as fact, and not as an illustration of Gestalt principles, might seem to the student an arbitrary choice for inclusion in an elementary text.

The separate chapters are veritable mines of information, complete, up-to-date, with excellent bibliographies; Purdy's chapter on vision, Beebe-Center's on pleasantness and unpleasantness, both rather technical, are illustrations. Humphrey's discussion of thinking and Katz's on personality are probably among the best on these subjects that can be found in introductory texts. But they are possibly furthest removed from carrying out the editors' explicit aim. They give the student an excellent orientation and discuss approaches to the problem rather than facts. But whether the book as a whole can be used for introductory courses without a systematic orientation supplied either by the instructor or a supplementary text remains to be seen. The editors' contention that "experimental psychology has reached the stage of maturity" is being put to a crucial academic and pedagogic test.

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PRINCIPLES OF GESTALT PSYCHOLOGY. By K. Koffka. New York: Harcourt, Brace, 1935. Pp. xi + 720. $6.00.

The author says that he intended to write a book that would stand in an intermediate position between Köhler's *Gestalt Psychology* and an "ordinary text-book". To the reviewer, the latter term implies three things: (1) a general, brief treatment of a majority of the topics in psychology, (2) handled in a relatively elementary manner, and (3) little or no explicit emphasis upon the author's systematic point of view. The present volume does not fulfill any one of these criteria. Koffka frankly admits that the main purpose of his exposition was the integration and consistent development of a great mass of experimentally verified facts, but in order to bring the book within reasonable limits many other facts had to be omitted. The reader will not be surprised to find that the facts which are emphasized are those in the fields of visual perception, and memory and learning, though there are two chapters on action (the first on the reflexes and the Ego, the second on attitudes, emotions, and will), and one on society and personality.

Koffka offers two criticisms of the average general psychology textbook: (1) the presentation of the problems is frequently inconsistent and not systematic in point of view, and (2) he feels that the usual approach does not tell the student much about human nature and its behavior (by definition the subject-matter of psychology). He rather resents the fact-finding hunts in which the majority of psychologists indulge and favors more theorizing, providing it is based upon known facts and is flexible

enough to permit adjustment to new factual discoveries. He is particularly anxious to emphasize the organization and integration of specific facts in such a way as to bring out their essential unity. As he says, ". . . science is *rational;* the facts and their order are one and the same; facts without order do not exist; therefore if we know one fact thoroughly we know ever so many more facts from the knowledge of this one fact".

Psychology is defined as the science of behavior, and its task is "the study of behavior in its causal connection with the psychophysical field". Using Tolman's terms, molar and molecular, Koffka analyzes psychology as a study of molar (as opposed to molecular) behavior; behaviorism's sterility rests upon the emphasis that behaviorists place upon molecular behavior. For Koffka, both physiological and psychological processes are molar, and furthermore as Köhler says, they are isomorphic phenomena, so that a dualistic philosophy is avoided. The concept of gestalt is defined in a quotation from Köhler: the word gestalt "has the meaning of a concrete individual and characteristic entity, existing as something detached and having a shape or form as one of its attributes". Koffka goes on to say: "A gestalt is therefore a product of organization, organization the process that leads to a gestalt. But as a definition this determination would not be enough unless one implied the nature of organization, as it was expressed in the law of prägnanz, unless one remembered that organization as a category is diametrically opposed to mere juxtaposition or random distribution. In the process of organization, 'what happens to a part of the whole, is determined by intrinsic laws inherent in this whole' (Wertheimer, 1925). On the basis of this definition we can call the process of organization no less 'gestaltet' than the products of organization, and in this wider connotation the term has been used in the title of this book and all along by gestalt psychologists."

As indicated above, in his philosophical point of view, Koffka is a monist: ". . . in our *ultimate* explanations, we can have but *one* universe of discourse and that (it) must be the one about which physics has taught us so much". He rejects both materialism and vitalism because neither gives an adequate place to all aspects of the universe.

As might be expected, the author's discussion emphasizes the laws of visual configurations; one is particularly grateful to him for his analysis of the concepts of field organization, which have been presented before, but are here developed in a particularly systematic way. The reviewer found his analysis of tridimensionality, illusions, and motion especially illuminating. Not only are detailed descriptions of much experimental work given, but the material is well summarized and integrated into an exceedingly consistent pattern.

In a very stimulating section, the Ego is considered as merely another object segregated in the psychophysical field according to the same laws as apply to visual constellations. It is admittedly difficult to bring such a complex organization into line with laws developed for a much simpler

material, but the author accomplishes it in a surprisingly satisfactory manner. The presentation is somewhat reminiscent of Miss Calkins (*e.g.*, the Ego is described as *having* a body). Koffka's criticism of the psychoanalysts' treatments of the Ego is based on his objection to their underlying philosophies—Freud being a materialist, Jung a vitalist.

Emotions are conceived as fields of force within the Ego—tensions and their release. The author's particular criticism of the usual treatment of emotions rests on the reification to which they have been subjected. For Koffka, emotions are not things, but dynamic forms of behavior. Again, he cites in considerable detail experimental material that will be of interest to everyone, though not everyone will agree with his interpretations of it.

The basis of memory and learning is continuity of behavior, which Koffka explains in terms of a trace theory. Although these traces are not new entities or functions, they are endowed with dynamic properties. In other words, memory is also merely organized and dynamic functioning within a field of environmental and behavioral forces.

As with all gestalt work, the reviewer finds the book very difficult reading. This appears to be a function of three factors: (1) gestalt psychologists seem to develop a peculiarly involved style, (2) the theoretical concepts discussed are philosophical in nature and therefore intrinsically complex, and (3) a specialized vocabulary is required. In this last respect, the present volume is particularly noteworthy; in addition to the gestaltists' usual terminology, Koffka has taken over some of Tolman's jargon! The author apparently feels that the word gestalt has taken out its English naturalization papers, for it is used throughout the book without being either italicized or capitalized. This is certainly a sensible step—the word is as much a part of our psychological vocabulary as chauffeur, *e.g.*, is of our daily vocabulary.

Looking at the book as a description of a system of psychology, the reviewer finds it eminently satisfactory—it is indubitably a system and a well integrated one. Furthermore, the various principles proposed are verified by numerous experimental studies; whether one cannot use the same experiments as justification for some other explanatory system is another matter. One sometimes feels that a relatively minor explanatory concept has been expanded to cover more than its fair share of psychological problems, but that may be a purely personal reaction. We particularly approve of the courageous attempts made to solve experimentally some of those complex problems in psychology which have long been neglected. That there is a growing interest in gestalt psychology in America is testified to by the appearance of several recent books and articles which attempt to clarify its concepts, and this book is a fundamental and significant contribution to this field. The reviewer doubts whether Koffka intended that the book be used as a text; her own attitude on that point is indicated in the first paragraph of this review.

DOROTHEA JOHANNSEN CROOK.

Skidmore College.

I. L. Peretz, Psychologist of Literature. By A. A. Roback. Cambridge: Sci-art, 1935. Pp. 457. $2.50.

That the author of the most significant work in the psychology of character and of the most extensive bibliography in the subject should himself produce a psychological biography may be looked upon with anticipation and welcome. That such a book should prove somewhat less stalwart than the theoretical and historical ground upon which it is founded may be attributed more to an overweening loyalty to the subject than to an applicability of the methodology. *I. L. Peretz* is a pioneer treatise of "a shining star guiding the destiny of Yiddish culture" (p. 7). Born in Poland in 1852 of Jewish extraction, Peretz wrote poems, allegories, feuilletons and short stories in Yiddish, the language commonly employed by the working class Jews. Roback purposes to acquaint a wider audience with "the luminary of Jewish literature" (p. 8) and to arouse an appreciation of this neglected writer. Nine portraits of Peretz appear among the sixteen illustrations.

Roback's treatment is divided into four parts: biographical, psychographical, critical and psychological. The first part deals with the early life of Peretz, his scholarship, his marriage, his life in a mortuary department and finally his illness and death in 1915. Owing to a lack of pecuniary means, writing had necessarily to remain an avocation for Peretz; however, his own struggles and his wide acquaintance with the poor provided his aesthetic nature a rich background for his literary work.

The psychographical part of the book describes Peretz's appearance, physical make-up, intelligence, "buoyancy of youth" (p. 188), magnetism, extraversion, organizing ability and integration. Such desirable character traits as tenderness, magnanimity, courage, freedom from inferiority complex, and generosity are accorded copiously to Peretz. The biographer's interpretation is always benevolent; if the evidence appears in the least damaging, extenuations are forthcoming. In this part considerable repetition occurs, frequently without apology (*cf., e.g.*, p. 162 and pp. 194–5, p. 163 and p. 209, *et* p. 167 and p. 209).

A *pot pourri* of psychological and literary criticism is offered in Part III. A discussion of Peretz's handwriting and of his facial resemblance to Albert Schweitzer is included along with a delineation of the romanticism and impressionism of "the grand man of Yiddish letters" (p. 198). Regarding certain implied inconsistencies in Peretz's literary method, the author states: "The apparent discord is merely the diphasic oscillation of the psychic pendulum which he, in common with others of his biotype, geniuses as well as simple folks, was subject to" (p. 275). Certain contradictions in the book obtrude themselves upon the reader; for example, we are told that the poet's "communal activities and organizing abilities were in evidence throughout his life" (p. 196) but later we are informed that "Peretz was not an able organizer" (p. 262). The most concise

estimate of this literary genius runs as follows: "He possesses originality, depth, a lofty conception, a beautiful diction, and in addition an extraordinary knack for pithy characterization" (p. 282).

The last part of the volume opens with the author's translation of Peretz's story, "Precipic" or "A Morning in a Cellar-House". The "thought-focus" (p. 338) is then dealt with as a psychological technique. It is because "*Peretz remained first and last, to his dying day, a psychologist*" (p. 330) that he understood so well the relationships between individuals. Action and plot are subordinate for him. In his understanding of individuals and their relationships the universal is touched, thus constituting a bid for his immortality. A study of the mysticism and the transcendentalism of the Yiddish writer completes the volume.

One gains the impression somehow from the preface through to the final chapter that Roback feels that he is fighting for a lost cause; the note of disappointment over "the shameful neglect of his People" (p. 13) is sounded time and again. Furthermore, it does not ingratiate his readers to be constantly reminded of an ample erudition in which they may not expect to participate; Roback seems to apprehend a show of indifference and a want of appreciation. There is a gesture of despair in limiting the edition of the book to less than a thousand copies. It may be ventured that a discouraged writer is rarely convincing, save, perhaps, in the use of a more satirical style.

Roback's charitable evaluation of his subject results in a panegyric which fails to win conviction. The present encomium abounds in such phrases as "the titan of Yiddish letters" (p. 170), "the dynamo of Yiddish literature" (p. 175), "the colossus of the Yiddish and Hebrew literature" (pp. 218–9), and "the shining star in the Yiddish firmament" (p. 221). A little more restraint and a more objective attitude might have strengthened the presentation.

The author's profuse interests, literary and psychological bud luxuriously throughout the volume. He seems to stimulate himself into fascinating if somewhat irrelevant digressions. Eulogies of Renan and of Emerson find a place in this work. Why a particular small town "should give birth to several geniuses" (p. 58) interests the author. The "organic diathesis connected with this artistic short-windedness" (p. 193) strikes Roback as a problem. The author is fertile.

The work is uneven in quality; for the most part, Roback is scholarly, sometimes, however, he is pedantic and at other times colloquial. The organization of his materials is loose and redundant. Regretful throughout that he has not written a longer and more recondite treatise, it may yet be, that the author's very presumption of a necessity of brevity, saves the book from being dull.

Irving Edison Bender.

Dartmouth College.

THE PSYCHOLOGY OF CHRISTIAN PERSONALITY. By Ernest M. Ligon. New York: The Macmillan Company, 1935. Pp. 393.

The author is a student of theology and a teacher of scientific psychology, having entered the latter field after some intensive study of the former.

As late as fifteen years ago a similar book would have borne, perhaps, some such title as: "The Psychology of the Christian Life" or "The Psychology of Character"; in fact the present title would not have been countenanced then by the scientific psychologist. But the title, now, thanks to recent progress made in discovering and defining with accuracy the component factors of personality, seems altogether appropriate and amply justified.

The book contains eleven chapters, a working bibliography and an index.

The affective reactions are regarded as the dominant factors in personality. "The emotional attitude is the functional unit" and "The type of personality—the health of mind of the individual—will depend upon the emotional attitudes developed." One's personality, then, is acquired, and its "healthiness and unhealthiness" can be measured by various emotional habits. When one's emotional habits are harmonious and mutually helpful, permitting all of one's natural energy to be directed toward one end, the personality is said to be well integrated. After discussing the concept integration according to orthodox views, the author gives as the main thesis of the book: that Jesus' teachings as given in the beatitudes and other parts of the gospels, when applied to a growing individual, will produce a normal personality,—and that the type of responses involved in such development is in accordance with the findings of modern psychology. It is repeatedly pointed out and especially in the interpretation of the beatitudes, that the responses (social behavior) made in harmony with them rests upon some native trait or natural impulse. This may be illustrated by the methods used to develop a peacemaker rather than a trouble maker. "Happy are the peacemakers: for they shall be called the sons of God." The problem for the teacher and the parent is training a peacemaker who to make any headway in resolving social conflicts must be magnanimous, unselfish, courageous, forgiving, etc. One type of training for early youth in forming these traits is sportsmanship and "To bring about true sportsmanship one must take advantage of all the innate tendencies in the child."

Two principles of Jesus' teachings, faith and love, are regarded as the essential forces in developing a normal Christian personality and as a consequence receive consideration from numerous angles.

The type of faith taught by Jesus was experimental, similar to the faith of the scientist exercised in his search for data to verify an hypothesis. Jesus appealed to experience time and again, evidenced by such declarations: "By their fruits ye shall know them"; "Every tree that bringeth not forth good fruit is hewn down and cast into the fire"; "The scientific

method is inherent in the teaching of Jesus''; ''It is no accident that science was born under the influence of Christianity and has had almost all its growth there.'' Students of the history of science will seriously object to such unfounded claims. It may be observed that the scientist has no objections to employing the concept, 'experimental faith' provided the problems involved are limited to a phenomenal world. It is possible to interpret most of the teachings of Jesus under that category and the author has done so for the most part.

Jesus' teaching on love is regarded as even a 'greater source' of spiritual power than that on experimental faith. ''It is one aim of this book to make some contribution toward an accurate knowledge of Jesus' teachings about love and what it can mean in society.'' The author assumes as an hypothesis that Jesus taught fatherly love instead of brotherly love, the latter being a popular view. The hypothesis has two advantages: (1) It avoids the impossible idealism involved in the principle of brotherly love when used in interpreting such sayings of Jesus as: ''Love your enemies'', ''Resist not evil'', ''Pray for those who despitefully use you'', etc. (2) It includes those facts of human behavior and emotional attitudes abundantly exemplified in the principle of fatherliness. The parable of the Prodigal Son ''points out—the contrast between the possibilities of brotherly love and those of fatherly love'' as guiding motivations of one's life. The father is made happy and rejoices at the return of the prodigal, shows mercy, and the very unworthiness of the prodigal ''only intensifies his forgiveness''. But the elder brother is grumpy. ''He objects to the splended reception of his brother because of 'the principle of the thing'.'' His argument is based on the ''cold justice of just reward for external behavior and conformity''; brotherly love believes in fair play and in even handed justice and too often forgets forgiveness and mercy.

The author regards these two principles as constituting the major part of the Sermon on the Mount. ''Psychologically the beatitudes fall into two groups. The first group consists of the attitudes of experimental faith. It includes the poor in spirit, those who hunger and thirst after righteousness, the meek and the pure in heart. The second group gives the characteristics of fatherly love. It includes those who mourn, the merciful, the peacemakers and those who are persecuted for righteousness' sake.'' One whose life has been shaped by and expresses these eight traits may be said to have a Christian personality. Each one of the eight beatitudes is taken in turn as classified above and its bearing upon the development of Christian personality is evaluated and likewise the emotions and attitudes fostered by it and those which it eliminates. The beatitude functions in all of these processes according to well established laws of psychology. Space prevents a detailed report of the illuminating interpretations and ingenious applications made by the author.

Some further report must be made, however, on the application of the

principles of 'experimental faith' and of 'fatherly love' in the management of fear and anger as they affect Christian personality.

The chapter entitled *The Chaos of Fear* undertakes to show that the principles of prevention and cure of fear as taught by Jesus are similar in kind to those advocated by modern psychology and that the methods and technique conform to those used by mental hygiene and psychiatry. A striking example in this connection is Jesus' teaching on the relation between fear and riches: "Lay not up for yourselves treasures upon earth, where moth and rust doth corrupt and where thieves break through and steal. But lay up for yourselves treasures in heaven, where neither moth nor rust doth corrupt and where thieves do not break through and steal. For where your treasure is there will your heart be also." Matthew 6:19–21.

Jesus employs here the psychological law of reconditioning. Note the original stimulus, treasures on earth, and the native response, acquisitiveness and the concomitant anxiety and fear, next the substitute stimulus or situation, treasures in heaven, and finally the changed emotional responses, "there will your heart be also". This brief formula is adequately elaborated in the text.

The second greatest enemy to the development of strong personality is anger arising from wounded vanity or injustice or blocked behavior. It is pointed out that the "man who is always busy standing up for his rights seldom has any to stand up for", "that a great man seldom loses his temper", "that the measure of a man is the size of the thing it takes to get his goat". The chapter entitled "The Measure of a Man" which considers Jesus' teaching on anger opens with this sentence: "Whoever is angry, is in danger." "This is the center of Jesus' teaching on anger—. He placed more emphasis upon these two emotions than upon any other phases of human behavior." Jesus gave the law of substitute response as one means of avoiding anger emotions as the following teachings show. "Ye have heard that it hath been said, thou shalt love thy neighbor and hate thing enemy. But I say unto you, Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you and persecute you." Matthew 5:43–44. We must replace hate with love, evil with good, cursing with blessing, etc. In each social relation one is required to act, to do something, and according to the author these several changed and reversed actions are characteristic of fatherly love, showing magnanimity, mercy, long suffering and forgiveness.

While the book was not written for the scientist, yet he will find in it new problems and new fields suggested for further investigation, *e.g.*, the prevention of anger, conditions for creative thinking. Both teachers and clergymen will welcome the illuminating interpretation of the beatitudes and of the Lord's Prayer in the chapter on Creative Thinking. The chapter on the Sources of Power should appeal to clergymen and students of the New Testament. Parents who have not surrendered the upbring-

ing of their children to child guidance clinics, to visiting teachers, to psychoanalysts and to 'industrial schools' will derive much profit from the didactic material given at or near the end of the chapters. The intelligent reader will be interested and instructed in the development of the thesis that the teachings of Jesus and the discoveries of modern psychology mutually reinforce each other when applied to the problems of personality.

The style is compact, incisive, direct, delightfully crisp and often has a positiveness that only one trained in theology would dare to adopt. The spontaneous good humor, fine optimism and daring sureness offer a refreshing contrast to the negativism, hopeless ethics and cynicism too prevalent in modern thought.

LINUS W. KLINE.

PSYCHO-ANALYSIS FOR TEACHERS AND PARENTS. By Anna Freud. New York: Emerson Books, 1935. Pp. 117. $1.75.

This book consists of a series of four lectures delivered before the teachers and workers in *Hort* schools in Vienna. (A *Hort* school is intended for the children, between the ages of 4 and 14, of working people; the children live at the school during the day, but return to their parents at night.) The lectures were intended to present psychoanalytic findings very simply, and so as to be of practical use to the teachers professionally.

The various stages of psychosexual development are discussed, and the chief psychoanalytic concepts defined. In the last chapter the author tries to show the significance of psychoanalysis for pedagogy. The three chief points mentioned are: (1) It offers a criticism of existing educational methods; (2) through it knowledge of the relation between the child and his education is extended; and (3) from a practical point of view, child analysis offers a technique for repairing the injuries inflicted on the child by his education.

The author quite frankly assumes a proselytizing attitude, foreseeing and answering many obvious objections to her point of view, and stating theoretical principles dogmatically as facts. For anyone who is conversant with psychoanalytic theory, nothing new is offered, but the easy style and logical organization makes it readily comprehensible to the layman. The translator's style is not ambiguous, but the book is clearly recognizable as a translation.

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